

THE IRON TRADE REVIEW

Volume LIII

CLEVELAND, AUGUST 21, 1913

Number 8

Large Steel Company Will Buy Basic Pig

*On Account of Being Compelled to Blow Out Furnaces for Repairs—
Southern Market Shows Much More Strength—Buying of Bridge Material*

BY GEORGE SMART

Heavier specifications against contracts are reported by some of the leading manufacturers for the first three weeks of August, as compared with a similar period in July. The tendency toward softening in finished material prices is not so marked as it was a week or so ago, and the volume of new business is very fair. That the consumption of pig iron by the steel works is fully up to producing capacity is shown by the fact that a large steel maker which recently was compelled to blow out several furnaces for repairs has entered the market in the Pittsburgh district for a large block of basic to fill the shortage in its requirements. The company is expected to close within a day or two for about 20,000 tons. A recent sale of 20,000 tons of southern basic was made at \$11.

Pig Iron

Sales of southern pig iron during the past week amounted to fully 50,000 tons and the market is showing increased firmness with \$11, Birmingham, apparently the minimum. Even on 8,000 tons of basic sold for shipment by the Steel Corporation to British Isles, it is understood that \$11 was obtained. The blowing-out of stacks in the Chicago district has brought about the equalization of production and demand. A leading Virginia company has advanced prices 25 cents, after selling a considerable tonnage, including several orders taken from cast iron pipe companies. A coupler company in New York state has purchased a part of the 5,000 tons of basic, for which it has been inquiring and is still in the market for malleable. Generally speaking, the pig iron market is firm and fairly active. Statistical reports of pig iron stocks in the Pittsburgh, Wheeling, Mahoning and Shenango valleys and northern Ohio districts show that the tonnage in the hands of steel works and merchant furnaces increased by about 10,000 tons during July. The total stock of iron in these districts during late months has been placed around 350,000 tons.

Prices

The eastern market is easier, but all makers are openly quoting 1.45c, Pittsburgh, on plates and shapes and are making concessions only on especially desirable business. This is particularly true of plates, although considerable comment was caused by the bid of 1.38c, Pittsburgh, made by the Carnegie Steel Co., on 10,000 tons of plates for a battleship to be built at the Brooklyn navy yards. Government business is not considered necessarily a criterion of the domestic market, but the low price named indicates an increasing eagerness on the part of some makers to obtain orders. Eastern mills are,

however, obtaining a rather surprising number of small orders at full prices and some mills are entering business at 80 to 90 per cent of capacity. Deliveries are given very promptly. Shading on sheets continues and deliveries are made quickly.

Bars

There has been very little buying of bars by agricultural implement manufacturers, partly because most of them have covered for their requirements and partly on account of the unfavorable reports in regard to the corn crop. The prospect of reduced corn yield in western states is making the implement companies conservative.

Railroad Buying

While there is a tendency toward more liberal buying of bridge material by railroads, and the Pennsylvania lines west have ordered 3,000 tons, it has not developed into very large tonnages, but heavier buying at a not far distant date seems certain. The New Haven railroad has an important grade elimination program to carry out, which will call for a large tonnage of shapes. It is evident that the losses occasioned by the flood of last spring in the central west will not be met for many months. Railroads, cities and counties are getting along with temporary bridges, which must soon be replaced by more substantial structures.

Structural Material

A very fair number of structural contracts were placed during the past week. The American Zinc & Chemical Co. has awarded 2,500 tons for the first unit of its new plant at Burgettstown, Pa., to the McClintic-Marshall Construction Co. This plant will ultimately require 15,000 tons. The letting of the general contract for 10,000 tons for the building of coaling stations at Panama insures that tonnage for Steel Corporation mills. Bids on 10,000 tons for another section of the elevated railroad extensions in Brooklyn have been received. An unusually large contract for reinforcing bars is for 2,600 tons required by the Superior viaduct, Cleveland. The Hunkin-Conkey Construction Co., Cleveland, is low bidder and will undoubtedly receive the contract within a few days. The McClintic-Marshall Construction Co. has taken 1,200 tons for a repair shop for the Lake Shore railroad, at Ashtabula, O.

Scrap

The old material market is gradually showing improvement in most centers. It is more active at Philadelphia and the prices are somewhat better in other centers.

UNIQUE FEATURES

Involvement in Plans of Norfolk & Western Railroad to Electrify.

The Norfolk & Western railroad, which extends from the tidewater at Norfolk, Va., to the coal fields of West Virginia, has contracted with the Westinghouse Electric & Mfg. Co., to supply all the electrical apparatus required to electrify the Bluefield-Vivian section of its line, some 85 miles in length.

The carrying out of this contract will give form to one of the most important projects of steam railroad electrification yet undertaken. The contract calls for the manufacture and delivery of 26 130-ton electric locomotives of the single phase-two phase type, together with all required power house generating machinery and transmission apparatus.

Single phase alternating current of a frequency of 25 cycles and at 11,000 volts pressure will be supplied to the locomotives through an overhead suspended trolley wire, and will be the identical type of the overhead system that has been used successfully by the New York, New Haven & Hartford railroad on its main line, by the Boston & Maine in the Hoosac tunnel, by the Grand Trunk railway in the Sarnia tunnel and by the New York, Westchester & Boston railway, for which installations the Westinghouse Electric & Mfg. Co. has furnished over 100 locomotives. The Norfolk & Western single phase-two phase locomotives, besides being very large and of enormous hauling capacity, will embody many unique features and requirements of design which, it is expected, will result in their showing unprecedented flexibility and economy of operation.

The Bluefield-Vivian section serves the celebrated Pocahontas coal region, one of the largest coal fields in the world. The tonnage of coal handled amounts to 65,000 tons per day, necessitating trains weighing as high as 3,250 tons. It is to facilitate the hauling of this heavy traffic that the electrical operation has been decided upon.

There are a number of grades on this section, the maximum being 2 per cent, and at the present three Mallet locomotives (the most powerful type of steam locomotives built) are required per train. One locomotive is used at the head of the train and two for pushing.

Only two electric locomotives will be required for this service and the present speed will be doubled. The

extent to which this quick train movement will enlarge the capacity of the railroad is apparent.

One of the present impediments to rapid operation of this section of the road is the extension of a 3,100-foot tunnel which is difficult to ventilate. This tunnel under electric operation will, of course, owing to the absence of smoke and noxious gases, offer no impediment to frequent train movement.

Since the Norfolk & Western locomotives are intended for handling what is known among railway men as "tonnage trains," they will be built for running speeds of approximately seven, 14 and 26 miles per hour.

LARGE PLANT

Will Be Built by Dodge Brothers to Make Automobiles.

Detroit, Aug. 19.—The Dodge Brothers Mfg. Co., which has made the major portion of the parts for the Ford automobile since the great Ford plant was established ten years ago, will not renew its contract with the Ford Motor Co. next year, and when its contract expires July 1, 1914, the Dodge Brothers will begin the manufacture of a moderate priced automobile which will compete with the Ford car.

This important announcement was made by John F. Dodge, president of the Dodge Brothers Co. The Dodge brothers, John F. and Horace E., are large stockholders in the Ford company, John being vice president of that company, but he states that they will continue to hold their interests in the Ford company, though he will probably give up the vice presidency when the competition is started.

The Dodge Brothers Co. has acquired a large tract adjoining its plant on Bismarck street, on which it plans to build, first, an assembling plant 900 feet long and to contain about 20 acres of floor space. This will be added to until a complete plant for the manufacture of everything that goes into an automobile is constructed. When the plant is completed, the Dodge company will employ from 8,000 to 10,000 men.

Meantime the Ford Motor Co. is rushing work on large additions to its plant in preparation to manufacture the parts which are now and have been provided by the Dodge Brothers Co.

Blows Out Stack.—The Thomas Iron Co., Easton, Pa., advises that it has blown out its No. 11 furnace at the Saucon plant, Hellertown, Pa.

ALLIS-CHALMERS

Will Move Two Departments From Chicago to West Allis.

Milwaukee, Aug. 19.—The Allis-Chalmers Mfg. Co. is preparing to move its mining machinery and boiler shop departments from Chicago and consolidate them with the main works at West Allis, Milwaukee county, within the next 90 days. To this end the company has just awarded contracts for the construction of two new buildings at West Allis, one a machine shop and the other a boiler steel workshop. The consolidation will add from 800 to 1,000 workmen to the 5,000 now employed in the main works.

Gen. Otto H. Falk, president of the company, in confirming the report, explained the reason for the change as follows:

"A careful study of conditions in the past with reference to the Allis-Chalmers company and its affairs shows the company has been handicapped by an excess of manufacturing capacity as compared with its average volume of business. This has naturally interfered with efficient handling of business and economical operation. When it is considered that the company now operates works in Chicago and the plant of the Bullock Electric Mfg. Co., in Cincinnati, in addition to its Reliance and West Allis works at Milwaukee, it becomes apparent that the best results can be obtained through a partial consolidation of the various plants to such extent as will enable the new company to largely confine its manufacturing operations to works operated at near capacity as possible and which at the same time will allow room for a very substantial increase in volume of business.

"Another consideration is that the large contracts now taken by the company comprise machinery made at different plants and the cost of assembly and shipment of such contracts is necessarily larger than if they were built in one place. After studying these conditions we have decided that the best interests of the company require that a portion of the work performed at our Chicago works be transferred to Milwaukee. The West Allis works of the company are now sufficiently ample to properly take care of this work and allow for a reasonable increase in the total volume of business with the exception that a building will have to be erected for boiler shops, flange shop, welding shop and perforating shop purposes."

PIG IRON OUTPUT

Of Canadian Furnaces for First Half of Year.

The Bureau of Statistics of the American Iron and Steel Institute has received direct from the manufacturers complete statistics of the production of pig iron in Canada in the first six months of 1913. Every furnace has been heard from. Statistics for the whole year of 1912 were also compiled by the bureau. For all prior years they were compiled by the American Iron and Steel Association. Half-yearly statistics for pig iron for Canada for 1912 were not collected by the association.

The production of pig iron in Canada in the first six months of 1913, including ferro-silicon and ferro-phosphorus, amounted to 545,981 gross tons. The output in the whole of 1912 was 912,878 tons. The production of pig iron in the two halves of 1912 is not available. Of the total in the first six months of 1913, 532,431 tons were made with coke and 13,550 tons with charcoal, coke and electricity, etc. In the whole year 1913 Canada will probably make over 1,000,000 tons of pig iron.

The production of basic pig iron in Canada in the first half of 1913 amounted to 292,625 tons, Bessemer pig iron to 125,052 tons, and foundry pig iron, ferro-silicon, ferro-phosphorus, etc., to 128,304 tons. Forge pig iron was not reported.

Of the 545,981 tons of pig iron produced in the Dominion in the first six months of 1913, 345,810 tons were delivered to mixers, open-hearth furnaces, etc., in a molten condition, 141,680 tons were sand cast, and 58,491 tons were machine cast.

Active and Idle Blast Furnaces

On June 30, 1913, Canada had 20 completed blast furnaces, of which 13 were in blast and 7 were idle. Of the total 16 furnaces usually use coke for fuel and 4 use charcoal. Two furnaces were being built on June 30—one charcoal and one coke. In the first half of 1913 two plants made ferro-silicon and ferro-phosphorus in electric furnaces.

During the first six months of 1913 the number of furnaces actually in blast during a part or the whole of the period was 15, of which 14 used coke for fuel and 1 used charcoal.

Of the 15 furnaces in Canada which were active in the first half of 1913, for 180 days, 1 furnace ran for 174 days, 1 furnace ran for 171 days, 1 furnace ran for 139 days, and 1 furnace ran for 42 days. The average

number of days the 15 active furnaces ran was 167.6.

One entirely new furnace was completed in Canada during the first six months of 1913, namely, the No. 7 coke furnace of the Dominion Iron & Steel Co., Ltd., at Sydney, Cape Breton, Nova Scotia, which was first blown in on May 22. It has an annual capacity of 91,250 tons of basic pig iron.

Building Blast Furnaces

As already stated, 2 blast furnaces were being built in the Dominion on June 30. One of these furnaces will be operated by the Canadian Furnace Co., Ltd., at Port Colborne, Ontario. When completed it will be 85 by 19½ feet, and will have an annual capacity of about 125,000 gross tons of Bessemer, foundry, and malleable pig iron. Lake Superior ore and Connelville coke will be used. It is almost ready to blow in. Construction was commenced in July, 1912.

The other furnace is being built at Parry Sound, Ontario, by the Standard Iron Co., Ltd., of Montreal. When completed it will be 60 by 12 feet and will have an annual capacity of about 36,000 gross tons. Charcoal will be used for fuel. The construction of the furnace was commenced in July, 1912, and it will probably be ready for blast late in August. Hematite and magnetite ores from Michigan and the Province of Ontario will be used. The Standard Iron Co. also operates a charcoal furnace at Deseronto, in the Province of Ontario.

Annual Capacity of Completed and Building Furnaces

The annual capacity of the 20 completed blast furnaces on June 30, 1913, was 1,391,550 gross tons, and of the 2 building furnaces it was 161,000 tons, a total of 1,552,550 tons. Of this total, 1,354,750 tons represented the capacity of the completed coke furnaces and 36,800 tons the capacity of the completed charcoal furnaces. The capacity of the building coke furnace was 125,000 tons and the building charcoal furnace 36,000 tons.

Will Require Ten Thousand Tons of Steel

The general contract for large coaling stations to be built at Cristobal and at Balboa, on the Atlantic and the Pacific ends of the Panama Canal has been awarded jointly to the Hunt Construction Co. and to Augustus Smith of New York City. These plants will be of a very extensive character

and will not only have the mechanical facilities for the rapid loading and unloading of coal but also will have the capacity for storing vast quantities of the fuel. About 10,000 tons of steel will be used in their construction and this material will be furnished by the United States Steel Products Co.

SEEK MARKET

Philadelphia Merchants Organize for Levant Trade.

Philadelphia, Aug. 19.—As a result of an invitation issued some time ago by the American Chamber of Commerce, of Constantinople, for co-operation on the part of American manufacturers, with the object of developing the market in the far east for American products, the Philadelphia Commercial Museum has organized a Philadelphia-Levant section. Its object will be to promote the sales of Philadelphia-made products in the Levant. Dr. William P. Wilson is president, Dudley Bartlett is secretary and Wilfred H. Schaff treasurer. Mr. Bartlett, who has been an honorary member of the American Chamber of Commerce of Constantinople almost since its inception, believes that similar sections will be organized in New York, Boston, Detroit, Chicago and other cities, and that as a result American trade with the Mediterranean and Black Sea markets will be largely increased. The members of the Philadelphia-Levant section at present include: S. L. Allen & Co., agricultural implements; The American Pulley Co., pulleys and shapes; Baldwin Locomotive Works; Barrett Manufacturing Co., flooring and roofing; the J. G. Brill Co., electric railway cars and trucks; Crew-Levick Co., oil refiners and producers; Thomas Devlin Mfg. Co., metal fittings; Henry Disston & Sons, saws and files; The Enterprise Mfg. Co., of Pennsylvania, hardware specialties; Stanley G. Flagg & Co., malleable iron fittings; David Lupton's Sons Co., construction for light and ventilation; McCaffrey File Co., files; Miller Lock Co.; H. K. Mulford Co., manufacturing chemists; National Specialty Mfg. Co.; North Brothers' Mfg. Co., ice cream freezers and tools; Peoria Paint Co.; Fayette R. Plumb, tools; William Sellers & Co., Inc., machine tools; Southwark Foundry & Machine Co., railway ties and wheels; Welsbach Co., gas lights and fixtures.

The Empire-Steel & Iron Co., Catasauqua, Pa., has blown out its Top-ton furnace. It will be repaired.

Heavier Specifications at Pittsburgh

*With Small Orders More Numerous—Pig Iron Prices Firm
—Plates and Shapes Stronger—Sheets at Bottom Prices*

BY C. F. WILLIAMS

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Heavier specifications against contracts, an increasing number of small orders and marked tendencies toward firmer prices have featured the iron and steel market this week. One important mill reports that specifications the first 18 days of August were approximately 100 per cent heavier than those received in the corresponding period in July, and other manufacturers have experienced considerable improvement, both in specifications and new orders.

Pig Iron.—Leading sellers of steel-making pig iron are asking as high as \$14.50 and \$16, valley, for basic and Bessemer, respectively, and the latter grade has sold at \$15.85. Sales, however, do not involve more than 1,000 tons. It develops that the Jones & Laughlin Steel Co. bought 10,000 tons of basic a short time ago instead of 5,000, as previously announced. A car manufacturer is reported to have closed for a rather heavy tonnage of malleable, which is being held at \$14, valley. No. 2 foundry also is listed at that figure by most sellers, although at least one interest continues to offer this grade at \$13.75.

Ferro Alloys.—The market for ferro-manganese and ferro-silicon is quiet, and it is not improbable the price of the former alloy could be shaded by a cautious buyer.

Plates and Shapes.—Any question regarding the price of structural material a week ago has been entirely eliminated by the fact that leading plate and shape makers in this district have announced that the 1.45c quotation is decidedly firm, and indications are that the market is stronger today than a fortnight or month ago. Some new buying has been enjoyed, and specifying continues heavy. Shipments have continued to improve, but most makers have enough tonnage on their books to assure maximum operation for 60 or 90 days.

Sheets.—Last week experienced more new buying than had been enjoyed for several months, and the fact that several cautious buyers figured in the market leads to the belief that sheet prices have reached rock bottom. Prices have shown no signs of improvement, however, and blue annealed products are not quoted at 1.65c for

No. 10 gage, as against a spread from 1.65c to 1.75c a week ago. The American Sheet & Tin Plate Co., operated about 75 per cent of its sheet mill capacity, and would have exceeded that figure were it not for repairs under way at the Scottdale works.

Rails and Track Material.—Mills rolling rails in this district continue to operate at maximum capacity, and have enough actual specifications on hand to assure activity several months. Spikes are quiet and not above 1.70c for standard sizes.

Billets and Sheet Bars.—Although leading makers have sold sheet bars this week at \$27.50, mill, it is learned from a reliable source that a consumer in this district closed for 3,000 tons of open-hearth sheet bars a few days ago at \$24.75, mill. Whether that purchase cleaned up all the available material at that price is not known. A number of negotiations have been opened, and further insight into the actual situation is expected to be enjoyed this week.

Hoops and Bands.—Within the last ten days, it has been rumored that steel hoops were obtainable at \$2 a ton less than the prevailing price. Sales have been too light to offer much insight into the situation, but it is known that leading makers are refusing to shade 1.60c.

Iron and Steel Bars.—Steel bars are decidedly strong at 1.40c and are as firm at that figure today as they were several months ago. Iron bars are obtainable at 1.60c, although as high as 1.70c is asked by some mills. Irregularity in the price of shafting has disappeared and makers are refusing to sell at less than 62 per cent off, and considerable tonnage continues to command 60 per cent off.

Muck Bar.—Some of the larger mills have not yet started operations, refusing to sign the scale asked by United Sons of Vulcan. Some scarcity is reported, but \$31, Pittsburgh, continues to represent the market.

Bolts, Nuts and Rivets.—Although manufacturers report that better conditions are enjoyed, it is understood some irregularity continues to characterize the market, but there has been no recent changes in prices. The market appears stronger than a month ago.

Iron and Steel Pipe.—The recent

reduction in the price of butt weld steel pipe, making discounts equivalent to those effective the early part of the year, apparently has had a good effect upon the market. Lap weld steel pipe and iron pipe continue in good demand.

Boiler Tubes.—Merchant and locomotive tubes continue in good demand and mills will be kept busy the remainder of the year filling orders now on books.

Tin Plate.—All makers are holding firmly to the prevailing \$3.60 base price, but no great activity is expected until fall. The leading interest operated about 84 per cent of its active tin mills last week.

Wire.—Reports that an official reduction of \$3 a ton had been made in the price of wire products are denied, but it is true that maximum quotations have entirely disappeared, and nails are not selling above 1.65c. Manufacturers say that the gradual decline in prices has resulted in improved activity, and there is every indication that wire products will be firmly established on the basis of 1.45c for plain wire and 1.65c for nails.

Wire Rods.—No change in the market for wire rods has taken place this week, and both Bessemer and open hearth products continue to be named at a range from \$27.50 to \$28, Pittsburgh.

Coke.—The market is quiet, but \$2.50, ovens, continues to be the price of blast furnace fuel. Fancy prices for spot delivery, however, have disappeared. Foundry coke is rather active, and some of the more important dealers are refusing to shade \$3, ovens, for either delivery. The Connellsville *Courier*, for the week ending Aug. 9, says production was 392,825 tons, an increase of about 7,000 tons over the week before.

Old Material.—Some of the heavy melting steel recently offered by railroads is understood to have brought as high as \$13, direct from consumers, but dealers have not been able to sell above \$12.75. Consumers are fairly well covered and the market is quiet, although some grades have displayed slight strength.

Made Tonnage Record.—In spite of a strike of molders, coremakers and patternmakers at the plant of the Columbia Steel Co., at Pittsburg, Cal., May 21, July made the highest tonnage record for the works. Recognition of the union was the only point at issue, and the company refused this as its plants at Pittsburg and at Portland, Ore., always have been open shops.

Buying at Chicago is Not Active

As Consumers Are Hoping for Price Reductions—Deliveries Constantly Growing Easier

BY H. COLE ESTEP

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The opposing forces acting on the steel market seem to be well balanced at present and the situation has changed very little during the past ten days. Buyers are persistent in their policy of withholding new business in the hope that substantial price reductions may ensue, but so far the steel makers have been able to prevent any breach in the ramparts. With one minor exception, there are no reports of price cutting in the west on plates, shapes or bars. The delivery situation, however, is constantly growing easier, indicating that the mills are rapidly taking care of the orders on hand. The actual consumption of finished materials continues almost without diminution.

Pig Iron.—Scattering sales for small tonnages characterize the situation in pig iron. Most of the largest buyers are covered for the time being and there are no inquiries of consequence in this market. The recent wave of activity has left prices, except on charcoal iron, from 50 to 75 cents per ton higher than they were in the middle of July. Enough furnaces in the Chicago territory have been blown out to equalize capacity and demand. As a result, there has been no tendency to shade prices since the recession of the buying movement. Both northern foundry and malleable Bessemer are firm at 15, Chicago furnace, and southern iron for this year seem to be well established at \$15.35, Chicago. For prompt shipment, a few odd lots could undoubtedly be picked up at \$10.75, Birmingham.

Merchant Bars.—There has been a fair run of specifications during the past 10 days, so that western mills are in a little better shape than they were at the first of the month. New business in steel bars, however, continues light and it is not difficult to arrange for mill shipments in from 10 days to two weeks if the specifications are satisfactory. The weakness in iron bars continues, owing largely to a lack of railroad orders. The iron mills are receiving a good run of business from their ordinary customers, but practically nothing from the transportation lines. In some

cases 1.45c, Chicago, has been shaded, although it is not believed that this practice is sufficiently general to establish a market. The price of shafting out of stock remains unchanged.

Plates and Structurals.—Some of the independents report an increase in new business. Specifications are practically unchanged. There is absolutely no evidence of prices less than 1.45c, Pittsburgh, in this market except on sheared plates. It is reported Ohio mills have quoted 1.40c, Pittsburgh, on this commodity for shipment into the Chicago territory, but it is doubtful whether there have been actual sales at this price. The local makers admit that the situation is delicate, but strenuously deny that there has been any shading up to date.

Rails and Track Fastenings.—There is practically nothing new or interesting in the standard rail situation. Some of the western lines are holding back on the consideration of their requirements until the condition of the corn crop is more fully determined. The official prices on light rails are being shaded about \$1 a ton owing to low prices made by rerolling mills. Track fastenings are firm at the new level established last week.

Bolts, Nuts and Rivets.—The price of structural rivets remains fairly firm at 2.03c, Chicago. The demand for bolts and nuts is erratic. Scattering orders of small tonnage are the rule. Some of the implement makers are commencing to specify against their recent contracts.

Sheets.—Local prices remain lower than the Pittsburgh quotation plus the full freight rate. There is less tendency to shade on galvanized sheets on account of the advancing quotations on spelter. The demand is fair, but not sufficient to satisfy the makers, although most of the mills have enough orders ahead to run for a couple of months. The prices being made to consumers are governed to a large extent by the individual conditions surrounding each sale.

Wire Products.—The market has apparently settled to 1.65c, Pittsburgh, for nails and barb wire. This quotation has been made recently in the west by the leading maker and also all of the independent manufacturers of wire. The establishment of the market on a lower basis seems to be

having a beneficial effect and specifications are encouraging in spite of bad crop reports in certain sections.

Cast Iron Pipe.—There have been no lettings of any consequence recently. The makers are holding up their prices rather firmly, more on account of the stiffness in pig iron than by virtue of any special condition existing in the pipe trade.

Merchant Pipe and Tubes.—The re-adjustment in mill quotations on certain sizes of steel pipe, announced last week, has had an effect on warehouse prices in this district. Also the announcement has prevented any active buying, consumers being willing to wait until they think the situation is more settled. Buying for current needs from stock is fair.

Old Material.—The scrap market is noticeably weaker and all attempts to create a boom have been abandoned. Transactions have been a little heavier because the market has reached a point where the larger consumers feel justified in buying. Rerolling rails, pipes and flues and cast and mixed borings are among the weaker items. Rerolling rails have recently been sold at \$12 per gross ton, Chicago. Most of the heavy railroad offerings placed on the market during the past week have been absorbed.

Engineers Are Bankrupt

A voluntary petition in bankruptcy was filed in the United States district court at New York City, Aug. 11, by the John F. Stevens Construction Co., engineers and contractors. The liabilities are \$318,743 and the assets \$301,551. The company has the contract for the construction of one of the sections of the subway extensions in the Bronx and is engaged at present upon other important work. The court has named Joel Rathbone, vice president of the National Surety Co., and Frederick W. Stelle as receivers with authority to continue the business for 20 days. John F. Stevens, the head of the company, was appointed chief engineer of the Panama canal by President Roosevelt and subsequently resigned to go into railroad work.

C. E. Sanders has been appointed general purchasing agent of the Emerson-Brantingham Co., Rockford, Ill. For the past year and a half Mr. Sanders was connected with the Janesville Machine Co., Janesville, Wis., and prior to that time he was secretary of the National Plow Association for about four years. He has also been purchasing agent of the Walter A. Wood Mowing & Reaping Machine Co., Hoosick Falls, N. Y.

Strike Causes Delay in Shipments

At Allouez Dock—Pig Iron Firm in Cleveland Market—Bids on Large Tonnage of Reinforcing Bars

BY GEORGE SMART

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Cleveland, Aug. 19.

Iron Ore.—The iron ore movement is heavy, though August shipments will show a falling off from July figures, owing to the strike of the ore handlers at the head of the lakes. The loss, however, will be more than made up during September, unless weather conditions should prove unusual. The strike has been declared off by the men and the Missabe docks are operating with practically full equipment. The Allouez dock is running about 50 per cent capacity, as the Great Northern has declined to take back the disturbing Finnish element and is operating with new men. Dispatch at the dock is therefore slow for the time being with about 11 vessels waiting for cargoes on Tuesday. The burden has been thrown upon the other docks, which have been worked up to the capacity of the mines to furnish the ore. It will probably be a week yet before the trade reaches a normal state. The strike has brought out one fact with startling clearness, and that is that the average dispatch of the unloading docks is greater than that of the loading docks.

Pig Iron.—The market continues strong, but without great activity. The Cleveland furnaces are known to be adhering rigidly to their quotations and therefore are not receiving many inquiries. When sales have been made, they have been at full prices.

Coke.—One of the largest dealers in foundry coke has withdrawn from the market so far as contracts are concerned and other sellers are adhering firmly to quotations. There is some contracting for foundry grades. Furnace coke is held firmly at \$2.50, ovens.

Finished Material.—The insistent demand for quick deliveries continues to be the strongest feature of the present situation, which is characterized by irregularities in quotations on some products and diminished specifications. In some cases, deliveries are given with surprising promptness. One large buyer recently had an experience which indicates how quickly shipments of sheets can be made. Two or three days after placing an order, he discovered that an error had

been made and endeavored to correct it, but was informed that the sheets had already been shipped. Sheet quotations are reported to have been reduced in some sales as low as 2.15c on No. 28 black and 3.10c on No. 28 galvanized, but the usual quotations are 2.20c on black and 3.20c on galvanized. Independents have taken the lead in reducing prices of wire products, as heretofore noted, and the largest interest is meeting the competition. Reduced quotations on wire products do not seem to have encouraged any large amount of new business. Cleveland iron mills are in operation and have a fair accumulation of orders, but new business comes in very slowly and it is necessary to make low prices in competitive territory, but 1.45c is the quotation for local shipment.

Bids were opened Aug. 16 on the Superior viaduct, calling for 2,630 tons of reinforcing bars and about 400 tons of structural material. The Hunkin-Conkey Construction Co. is the low bidder and will probably be awarded the contract after the bonds have been sold. Keen competition continues in shafting, but 63 per cent off is granted only in exceptional cases and 62 per cent off is the usual quotation.

Old Materials.—Sentiment seemed to improve in the scrap market during the past week, although consumers still moved cautiously and large deals were few. Heavy steel is stronger, as high as \$11.50 being offered for tonnages. The market for busheling is excited, and higher prices are quoted, but consumers are said to be over-supplied, and unless the general market improves there is likely to be a slight recession in this grade. The spurt taken by machine shop turnings a short time ago seems to have lost its force, and the market is gradually settling.

Will Direct Finances.—Arnold B. Keller has resigned the cashiership of the Gary State bank and next month will take up new duties as one of the three executives in the treasury department of the International Harvester Co. at Chicago. He will be assistant to Harold McCormick and will have jurisdiction over the

finances of the corporation. Mr. Keller, who is 32 years old, is a brother of R. C. Keller, vice president of the Colonial Trust & Savings bank of Chicago.

CHARCOAL SALE

Most Important of the Week in the St. Louis Market.

BY E. C. ERWIN

Office of THE IRON TRADE REVIEW,
St. Louis, Aug. 19.

Pig Iron.—Inquiries for pig iron in the St. Louis market are confined to one for 500 tons of high manganese, 100 tons of southern No. 1 soft, and several scattering lots, mostly for southern No. 2. The most important sale last week was made Friday of 5,000 to 6,000 tons of Lake Superior charcoal iron for silvery in St. Louis. Southern No. 2 is strong at \$11, f. o. b. Birmingham. Northern iron is quoted at \$15, Chicago furnace, and at \$14 to \$14.50, f. o. b. Ironton.

Coke.—The market for coke is very firm at \$3 as the bottom price, and some few sales have been made at \$3.25. This is for 72-hour Collinsville and Virginia foundry grades.

Old Material.—Local rolling mills are again operating, and considering the consumption of material, dealers in scrap iron look for stronger conditions to prevail within the next 60 days.

Steel continues to be firm, and dealers are optimistic. Relaying rails are quite active, one local concern having turned several large orders last week. No lists are out.

Building Diesel Engines

The actual work of building Diesel heavy oil engines has been started in the new plant of the Busch-Sulzer Brothers Diesel Engine Co., at Second and Utah streets, St. Louis. The plant, said to have cost \$1,000,000, is not entirely finished, but a force of men has begun work in the pattern shops, and in less than one month the machine and erecting shops will be at work on the castings for the new type of engine. A strong demand for these engines is said to have come from Oklahoma, Texas and the southwest.

Howard T. Wallace and James P. Winchester, receivers for the Diamond State Steel Co., are ordered by Judge Edward G. Bradford, of the United States court, to repay to the estate of the corporation \$21,467.85, which they expended for expenses held unnecessary.

Cincinnati Market Appears Stronger

But There is No Radical Change—Car Company Enquires for 1,000 Tons of Malleable and 1,000 Tons of Foundry

BY S. G. BACKMAN

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, Aug. 19.

Pig Iron.—Sales continue few and small and inquiries are rather scarce and for light tonnages. It is generally stated that the market appears a little stronger despite the quiet condition it has undergone for some time, but continued reports of lower prices counterbalance this, even though they cannot always be verified. The only cause for a strengthening in prices is the fact that there has been a curtailment of production recently, as for instance in the south, where there is only one furnace in blast in Tennessee, all of which always strengthens the situation proportionately. Also several furnaces state that they are fairly well sold up for this year's production, and that they do not as yet care to quote on next year's business.

In the south, \$11, Birmingham basis, appears to be the minimum quotation for strictly No. 2 foundry iron for last half shipment from both Tennessee and Alabama furnaces. Whether or not concessions are being made below this figure on actual sales cannot be stated as a certainty, but rumors to this effect are continually being heard. It is known, however, that several sales have been made within the past few days at \$11, Birmingham, including iron from both of the above named states.

It is not known that any No. 2 foundry iron has been sold in southern Ohio below \$14, Ironton, for this year's delivery, although several large sales of basic iron have been recently made at a low figure. Most furnaces are rather firm as to the above price, and although they are continually receiving offers at \$13.75, Ironton, for foundry iron, they have not, as a general rule, made any concessions.

The Virginia Iron, Coal & Coke Co., at Roanoke, Va., has announced the following prices effective for last half shipment: Two to 2½ per cent silicon, \$13, furnace, and 2¼ to 2¾ per cent silicon, \$13.25, furnace, with all other grades in proportion.

The only general inquiry of importance is from the Barney & Smith Car Co., Dayton, O., for 1,000 tons of malleable iron and 1,000 tons of foundry iron for the last half.

Coke.—Prices continue very strong

despite the fact that only a few sales are being made at the present time. Shipments, however, are going forward fairly well, mostly on 72-hour grades on contracts previously placed. There appears to be more activity in the Connellsville district at present than in any of the others. The scarcity of labor in the Pocahontas and New River fields, and to a certain extent in the Wise County district, has greatly curtailed operations, and also the fact that coal from the southern fields is, bringing such a good price that the operators do not care whether or not they turn it into coke, has added materially in keeping up the strength of the market. Prices are unchanged in all of the fields, in most cases the minimum prices for spot and contract deliveries being the same.

Finished Material.—Outside orders are still being received by the local sheet mills in better quantities than usual at this time of the year. A good fall business is looked for especially from western territory. The mills are now from six to eight weeks behind on deliveries, but because of the inability to get steel,

they are not running at full capacity. Prices are unchanged at 3.30c for galvanized sheets No. 28 gage, and 2.25c for black sheets No. 28 gage, Pittsburgh basis. Reports that these prices have been shaded in the east have not had any effect toward a reduction in local territory.

Most of the shipments being made by the local warehouses at the present time are for surrounding points, as the local teamsters' strike has seriously handicapped deliveries here. The principal items of interest at the present time are the placing for the steel to be used in the various bridges throughout Ohio and Indiana that were washed away last spring. The building industry in Cincinnati is practically at a standstill, and appears to have been halted for some time because of local labor conditions.

Old Material.—The scrap iron market is unchanged but very uncertain. A few dealers state that slightly better offerings have been secured on some of the grades mostly in demand, but others say this cannot be verified. The local teamsters' strike and also that of the iron molders have partly paralyzed business locally, and as a result, most of the transactions at present call for outside deliveries. A few orders, however, have been taken in nearby territory, mostly for immediate requirements. The rolling mills are not taking as much as is their custom at this time of the year, and the whole situation does not present a very optimistic aspect.

Stiffening of Pig Prices in the East

With Many Small Sales—Shading on Shapes and Plates is Not General—Scrap More Active

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
611 Bulletin Bldg.,
Philadelphia, Aug. 19.

Reports from the middle west regarding price concessions being made in plates and shapes by eastern makers are apparently exaggerated. While the eastern finished market is manifestly easier both in tone and tonnage, and some shading of prices has been done as reported, there is no general deviation from the 1.45c, Pittsburgh schedule on shapes and plates. Makers show a determination to meet the market as it develops, but are reluctant to take the initiative in openly cutting prices. The next 30 days promise important developments. Pig

iron holds its own and slowly gains price strength. The outlook for heavier scrap buying is improved.

Pig Iron.—Numerous small sales and a continued slight stiffening of prices principally in foundry grades are still the most conspicuous features of the situation. The average sale is 150 to 200 tons, but the volume with most sellers is reported good. On northern irons, \$15.50, Philadelphia, for No. 2X has almost entirely disappeared. Some prompt iron was still done in the week on this basis. Most sales were at \$15.65 and \$15.75, with a few ranging up to \$16, delivered, and over. The Virginia Iron, Coal & Coke Co., after having sold a round tonnage to-

day advanced its price on Virginia iron 25 cents to \$13.25, furnace, for No. 2X and 50 cents to \$13 for No. 2 plain, and \$12.75 for the lower grades. This maker is credited with sales of 5,500 to 6,000 tons to Virginia pipe makers for this year's delivery and is also reported to have taken 5,000 tons or more from pipe makers in this district. The Delaware river pipe foundries are more actively in the market with indefinite inquiries, but would take a round tonnage. Pipe iron is quotable at \$14.50 to \$14.75, delivered, sales of about 1,000 tons on this basis being reported. The Baldwin Locomotive Works asks 1,000 to 2,000 tons of its cylinder or practically No. 3 grade for early shipment. There is no inquiry for basic, which remains quotable about \$15.25, delivered. Low phosphorus iron of 0.03 phosphorus is held at \$23.50, Philadelphia, and of 0.035 phosphorus at \$23, Philadelphia, at which small sales aggregating 800 tons are reported. A Chicago buyer took 500 tons of Lebanon low phosphorus at \$18, furnace. A local buyer took 300 tons of prompt malleable from a lake maker at \$16.25, delivered.

Iron and Steel Bars.—New business in steel bars is of meager proportions. Specifications are fair; the mills are still so well situated on bookings that the price of 1.40c, Pittsburgh, is very strong. The weakness in iron bars is unchanged, prices ranging from 1.25c to 1.35c, mill, on actual business. Low scrap costs are contributing to the softness of the market.

Plates.—Eastern Pennsylvania plate makers deny reports from the middle west that they are freely quoting 1.40c, Pittsburgh, for either eastern or western shipment. As previously noted in the case of battleship plates for the Brooklyn navy yard, one eastern maker quoted this price and in the easier condition of the market it is quite probable that the regular schedule might be shaded on a desirable order. At the same time, there is no evidence that any maker has adopted 1.40c as a regular schedule. Current bookings are reported by the mills to be on the basis of 1.45c, Pittsburgh, and leading buyers in the Philadelphia district state they have no quotations under the full price. Occasionally on western shipment eastern makers state they have absorbed some of the freight against them where tonnage carrying extras was offered, but the basic price has not been cut. New orders are at the rate of 75 to 85 per cent of capacity. Deliveries run from one to two weeks. A Philadelphia buyer took about 1,000 tons for a gas holder. A merchant vessel involving 1,800 tons

of plates and 800 tons of shapes is pending.

Structural Material.—There are indications that one eastern Pennsylvania shape maker is shading 1.45c, Pittsburgh, or 1.60c, Philadelphia, in scattered cases, but other eastern mills report they see no reason for changing their quotations at full schedule. All eastern makers in view of the restricted buying and the increasing need for tonnage, are disposed to meet the market as they find it, but so far, they state, they have not encountered the necessity of making concessions and in fact the attractive tonnages being offered are quite few as most new business is in small lots. Makers are reluctant to take any initiative in offering concessions. Deliveries have reached the point where on desirable orders, they can be obtained practically at the buyer's option. Fabricated business is sharply competed for and prices are suffering.

Sheets.—A strong demand for heavy sheets and light plates for prompt shipment continues. There is no buying ahead, however. The market in Philadelphia and vicinity holds firm at 1.90c.

Semi-Finished Material.—The new demand for billets is short and prices show easiness. About \$26, mill, is now being done on sizable lots of rolling billets, but inquiries of this kind are few.

Coke.—Eastern buyers of furnace coke report increased offerings of prompt fuel by the ovens the past week, but the price in all cases was \$2.50, ovens. A Lehigh valley maker is figuring on 5,000 to 10,000 tons monthly for last half.

Old Material.—Inquiry is more active and indications of heavier buying are more promising. Steel makers are offering \$11.50, delivered, on lots of 5,000 to 10,000 tons of heavy melting steel and would probably pay \$12, delivered, but merchants are declining to accept owing to their inability to obtain the material to cover at these prices. Three inquiries of size are out for low phosphorus scrap and this grade is stronger. Small sales of turnings at \$8.25, delivered, and of No. 1 railroad wrought at \$15, delivered, are noted. Re-rolling rails sold this week at \$14.50, delivered.

Mining Show.—In Philadelphia, Oct. 17-25, the American Mining Congress will hold its first national mining show or exposition. There has already been such a response from manufacturers that it is regretted that Horticultural hall, in which the exposition is to be held, is not larger.

TWENTY THOUSAND

Represents Total Pig Iron Sales in Buffalo—Prices Firm.

BY FRANK R. DOLBEE

Office of THE IRON TRADE REVIEW,
Buffalo, Aug. 19.

Pig Iron.—Scattered inquiries taken up by the local furnaces during the week resulted in a placement of about 20,000 tons, at prices which hold the schedule to the figures quoted for the past few weeks. There seems to be no disposition on the part of the producers to raise prices, and there are no indications that they will be lowered. They are being maintained equally as firmly as they have been at any time since the recent rebound from bed-rock took place. The interests consider that the indications which accompanied the transactions of the week are encouraging, while on the other hand the high price of coke and the low price of pig iron have acted like a wet blanket on the activity of the producers. The orders taken, while small and scattered, have been for the most part accompanied by imperative requests for early deliveries, showing the iron is going into immediate consumption, and that many of the melters are working along on close margins without providing stocks in advance to meet their ordinary requirements.

Finished Material.—Both orders and the volume of inquiries showed gains in the mill offices and agencies of the district over and above those of the past few weeks. None of the placements made were for large lots, but the aggregate represented a fair tonnage, at the prevailing prices, in bars, plates and shapes. Several interests reported doing a better business during the past week than during any week for the month. The delivery situation remains about the same, with the exception of the smaller mills. In the inquiry that has developed, it is reported that some new business has come out for the first time in a number of months. Pipe specifications continue good. In all of the lines there continues to be an absence of cancellations, and all of the producers say that prices are firm.

While the base on structural continues to be 1.45c, there seems to be a condition of lively competition among the fabricators. This has caused some concessions to be made in order to book business. The activity, however, has been confined to the interests that are not booked well ahead with orders for structural ma-

terial, and cutting on shapes and plates has been confined to very exceptional cases.

Old Material.—While there was more activity in the past week in all lines, with the exception of heavy melting steel, the volume of trading was not sufficient to cause any changes in prices from the schedule quoted a week ago. The principal

dealing was in cast borings, and, as previously stated, the buying came from the valley section. The major user is still out of the market for heavy melting steel. No price cutting has been resorted to as a means of inducing business and the yards are watching the pig iron market for a further raise so that they will be in a position to lift their schedules.

of 1.45c, Pittsburgh, or 1.61c, New York, continues to be done quietly in scattered cases, which is attributed largely to one eastern maker. In some cases, as low as 1.51c, New York, is reported. Makers, however, who are now more inclined to meet the market as they find it, generally report they are holding to full prices and regularly entering a fair business on this basis. New buying is not very brisk and deliveries are exceedingly prompt with eastern mills, some sizes now being obtainable in a week. Fabricating tonnage is only fair.

Cast Iron Pipe.—None of the eastern makers are now entering business up to full capacity, and they are operating on about a 75-per cent basis. Prices seem more irregular, the smaller sizes having softened. Some makers quote 8-inch \$1 under 6-inch. For the latter, considerably less than \$23, New York, has been done. The United States Cast Iron Pipe & Foundry Co. took for the city 955 tons of 6 to 12-inch at \$21.45, delivered, average, and 265 tons of 20-inch at \$21.85, delivered. Boston is putting out inquiries for 5,600 tons of 6 to 30-inch. Murphy Bros. are the low contractors on 3,500 tons for Queens. R. D. Wood & Co. is low on 800 tons for Chelmsford, Mass. Caiberean, Cuba, is reviving an inquiry for 4,000 tons.

Iron and Steel Bars.—Specifications against steel bar contracts with most makers continue to keep slightly ahead of July. There is little new business, however, and deliveries are easing up. Many sizes can now be had in from six to eight weeks. Bar iron continues irregular in price, depending upon the brand. The market ranges from about 1.25c to 1.35c at the mill.

Old Material.—Consumers show more willingness to make offers for scrap, but merchants find so much difficulty to get material at ruling prices that few of these negotiations are resulting in orders. At the same time, the market has a more promising outlook for better buying soon. Eastern Pennsylvania steel makers have been offering \$11.75, delivered, for heavy steel, and would probably pay higher.

Virginia Output Curtailed

Blast furnace operations in the Virginia district are now confined to six stacks. The Virginia Iron, Coal & Coke Co. is blowing two furnaces and the other active stacks are Princess, Pulaski, Buena Vista and Oriskany. One of these furnaces is expected to blow out for relining in the near future. The active Low Moor furnace, as reported, was recently blown out.

New York Pig Iron Market is Firm

With Fair Volume of Business—Coupler Company Buys Basic and is Figuring on Malleable

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg.,
New York, Aug. 19.

Ore.—Stock piles with eastern furnaces are quite large in some cases, but while some shipments have been diverted, no cancellations have been reported. Shipments are going forward very well, considering the curtailment of furnace operations. There is no new buying.

Pig Iron.—Under a continued fair buying, principally in small lots, the iron market in this district shows firmness and is more than holding its recent improvement. With Buffalo makers quoting firmly \$14, furnace, as minimum for No. 2X, or \$15.75 at points in this district, eastern Pennsylvania makers have continued gradually to raise their schedules to this basic and with one or two exceptions the furnaces are entering most of their business at this level. There is little \$15.50, delivered, tonnage now available, though one Jersey buyer in the week was able to obtain a lot of a certain eastern Pennsylvania brand of No. 2X at \$15.30, delivered. At New England points northern iron ranges from \$16.35 to \$16.45 for No. 2X. The Crane Valve Co., Bridgeport, Conn., asks 1,000 tons of No. 2X, and 1,000 tons of high silicon iron for early shipment. Another inquiry for about 3,500 tons for this district is under negotiation. A report that the New York Air Brake Co. is figuring on 10,000 tons is officially denied. A Connecticut buyer is understood to have closed for about 2,000 tons of additional malleable at \$14, Buffalo, basis. The Gould Coupler Co., Depew, N. Y., has closed with Buffalo makers for a portion of its inquiry for 5,000 tons of basic, but is still figuring on about 5,000 tons of malleable for shipment this year. A sale of 300 tons of malleable to territory at the

same price is noted. The Thomas Iron Co. plans to reduce its operations to a single stack by blowing out the small Alburts furnace. The Tennessee Coal, Iron & Railroad Co. has sold 8,000 tons of southern basic for shipment to the British Isles, understood to have been to Wales, at a reported price of \$11, Birmingham. An American pump maker has been figuring upon 1,000 tons of foundry iron for its English plant.

Ferro-Alloys.—Sellers of ferro-manganese report a number of small sales for early shipment at the full price of \$56, seaboard, although one middleman has been offering early material at \$55, seaboard, in some districts. The pending tariff bill still casts much doubt upon the market, which appears easy. Little forward buying is being done. One far western consumer continues to figure on 1,000 tons.

Plates.—There is no evidence of concessions from 1.61c, New York, or 1.45c, Pittsburgh, being made either by eastern or middle western on the small orders that are making up the major portion of the moving business today. There has been some shading on especially large orders placed in this territory, as recently reported, and makers seem more disposed to compete sharply on inquiries of this class, showing an easier mill condition. The market remains openly quoted at 1.45c, Pittsburgh. Eastern mills are making shipments in one to two weeks. The Lehigh Valley railroad is receiving bids on a number of car floats, barges, lighters and a tug, which will require several thousand tons of plates. The Lehigh Coal & Navigation Co. asks one to twenty steel canal boats, requiring 1,200 to 1,500 tons, largely plates. Car buying remains quiet.

Structural Material.—Some shading

Large Tonnages Sold in the South

Fully 50,000 Added to Order Books and Prices Are Hardening—Pipe Companies Buy Freely

BY W. B. NEAL

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., Aug. 19.

Pig Iron.—The tonnage entered by local producers since last report is materially larger than that entered in any week for some months past, and while the provision for advanced requirements was very liberal, the demand for spot and nearby deliveries was such that an advance of 25c per ton was successfully made in the asking price for several brands. Altogether, some 50,000 tons were added to order-books in the week, and a concession for the established price basis is not reported in any case. The aggregate includes a single lot of 10,000 tons of assorted foundry grades for delivery in the last quarter; five lots of 1,000 tons each, of No. 2 foundry, for last quarter shipment, while the smaller requirements entered by three of the leading concerns for last quarter delivery aggregated 20,000 tons, 13,000 tons, and 8,000 tons respectively. The sales made for spot delivery include a single lot of 4,000 tons of No. 4 foundry, which was entered at \$10.25 per ton at Birmingham, and 5,000 to 7,500 tons in carload quantities and lots of 150 to 500 tons each, entered at \$11 to \$11.25 per ton at Birmingham for No. 2 foundry, with a differential of 50c per ton for the No. 3 foundry engaged. A single lot of 2,000 tons for September delivery was sold at \$11 Birmingham for No. 2 foundry, and 600 tons of high silicon, high manganese iron, for shipment in 90 days, sold at \$12.25 per ton at Birmingham. The cast iron pipe manufacturing interests were represented most extensively in the week, although agricultural implement manufacturers, and manufacturers of stoves, as well as the jobbing foundries anticipated requirements very liberally. At the close of the week, a leading producer reports the requirement for unfilled orders as practically equal to the probable make from the present active capacity during the remainder of the year; two other large concerns have sold the probable make during the remainder of the third quarter, unless the capacity is increased, and a smaller interest has practically withdrawn from the market for any delivery in the remainder of the year. With such conditions, the market for the last quarter can but be considered correctly represented by the \$11 sched-

ule, while all spot deliveries have a tendency to advance from that basis.

Cast Iron Pipe.—Further curtailment in the output of smaller sizes resulted in the week, and prices obtainable for such business as is offered are no more attractive than at the time of last report. Movements against contracts entered early in the year are attractive in the aggregate, but with the unfilled tonnage being reduced, producers are finding it necessary to in-

crease stocks, and recent developments in the market for municipal bonds do not afford expectations for early relief.

Old Material.—Further improvement in the volume of inquiry is reported by local dealers, but the business transacted has not increased to any appreciable extent. Forwarding of carload quantities of machinery cast, and light wrought and steel grades continues at a nominal rate, and those grades are being assembled to a certain extent. But as a whole, the market has not improved to the same extent as the pig iron market, and with further decline in the asking price for the several finished iron and steel products, the outlook is not encouraging. Quotations can not be revised with accuracy, and are nominal in all cases.

Mixed Conditions in Great Britain

Expedient of Railroads Results in Large Supply of Cars—Tin Plate Still in Slough of Despondency

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Aug. 9.

Pig Iron.—This being bank holiday week, there is insufficient data on which to diagnose the condition of the iron trade, but certain significant circumstances may be noted. There is a widespread belief that rock-bottom has been reached. The heavy slump of the past few months has been checked, although buyers still hold a rather commanding position. There were no pig iron reductions on 'change on Thursday, but buying is still from hand-to-mouth. Political and trade influences are both more favorable than for some time past; the prospect of an early settlement of the Balkan trouble has already favorably affected the Cleveland market, while the more cheerful advices from America, and especially the news conveyed by THE IRON TRADE REVIEW cable, of increased buying and a rise of 25 cents, has been welcomed, both in Birmingham and the north of England. American influence, however, on the pig iron market in the absence of direct buyers has for some time been indirect, although very far from being unimportant. The position of certain Midland smelters has become almost desperate. Prices have been ruthlessly forced down, in some cases, nearly £1 per ton, and makers are probably speaking the bare truth when they say that a proportion of their iron is being made at a loss.

The only relief they have received has been in respect of coke, the price of which has been substantially reduced. Smelters have been called upon to make large sacrifices to the makers of finished iron, whose prices have fallen to a much less extent; while in other respects the mill owners have been more favorably placed. In many cases, the smelters have been saved from actual disaster, and from the blowing-out of furnaces, by the steady and fairly profitable demand for foundry iron, arising chiefly from the prolonged ship building boom, and an activity in engineering demands, probably without precedent. Many smelters have now put down their feet determinedly against further reductions, and assert their intention to obtain better prices before they look at long contracts. The position of forge iron is still largely unsatisfactory, and considerable quantities are going into stock. The statistics for July of pig iron shipments show a substantial reduction on those for last year, the loadings being returned at 106,000 tons, compared with 103,000 tons during July of last year. Stocks have been reduced during the month by about 2,000 tons. The amount in store is 193,000 tons. The continued reduction of stock is irresistible evidence of a tolerable undertone of strength in the market, in spite of certain discouraging influences. East coast hematite is in very modest request, mixed numbers for both early

and forward delivery selling at 71s (\$17.38.)

The selling price of No. 3 Cleveland iron is 55s (\$13.46) with 56s (\$13.70) three months. There is every sign that that market is approaching a healthier condition.

Finished Iron and Steel.—The bank holiday stoppage has coincided with what may be called an interregnum in the price regulation of iron. Only one reduction has to be added to that of last week, namely, a reduction of 10s (\$2.44) in bars declared by the South Yorkshire Bar Iron Association which makes the selling price £8 10s (\$41.64) per ton. The fall was inevitable in view of decreased demands and the lower price of pig iron. The makers of Yorkshire bars, like their confreres in Staffordshire, have been severely hit by a somewhat sudden falling off in the demand for railway wagons, for which certain new regulations, made by the railway companies, are almost wholly responsible. Two years ago, high-class iron, and especially South Staffordshire iron, secured a new lease of life through the decision by the wagon-building companies to use iron for the underframes of wagons, in substitution for steel, owing to the marked superiority of iron as a resister of corrosion. The Staffordshire mills had a great time, and were looking forward to some years of prosperity. Sudden disappointment has come upon them from a cause wholly unexpected. At the end of the first half-year, the managers of British railways put their heads together and determined to apply the screw to customers who kept their wagons in wharves and sidings for excessive periods. Accordingly, they imposed additional rent upon hirers for this excessive use of stock. There was a tremendous outcry at the time; but the new rules worked like magic in bringing the empties back to their owners. Thousands of wagons have been liberated, and, whereas a year ago the railway managers did not know which way to turn to obtain wagons, the trouble now is to obtain employment for their idle vehicles. In fact, a great many have been offered for sale. The general result is that orders for wagons, as well as for tires and axles, have been cancelled right and left; and some Sheffield firms who make wheels, axles and tires, are quieter than they have been for three years. It is clear that the rolling stock trade will for some time to come have to be carried on under much less favorable conditions than during the past three years.

The galvanized sheet trade has revived a little during the past fort-

night. The selling prices are now based on £11 (\$53.86) as a minimum, while some sellers are doing still better than this. The general iron trade covering strip, hoops and wire continues dull.

In the steel trade, it has not been found necessary to extend the reduction to other classes of steel which the British steelmakers recently declared in joists. Makers have no difficulty in realizing their full prices for section steel and other descriptions.

The trade in raw steel is quiet, billets selling at about £5 (\$24.48) per ton down to £4 17s 6d (\$23.88). Belgian steel at £4 10s (\$22.04) cannot very well compete with these prices. But the Welsh mills which produce most of the steel of this description made in this country are quiet, and South Wales generally has this week been idle, both in the steel and tin plate trades. The latter industry continues in the trough of depression, from which the conclusion of peace in the Balkans may possibly prove to be the first step in the way of rescue.

SELLING PLAN

Prepared by British Iron Makers Has Failed.

Birmingham, Eng., Aug. 8.—News has just been received of the failure of the scheme of certain Cleveland ironmasters to establish a selling agency for their make of Cleveland iron. The organization proposed to fix prices and control production. When the project was first broached, it received a fair amount of support. The mischief wrought through speculation in warrants, largely by an ignorant public merely indulging a gambling mania, engendered a strong desire by legitimate traders to eliminate this undesirable element; but from the first the scheme was strongly opposed by local and district iron merchants, for the sufficient reason that in the event of its success, some of them would have found their occupation gone. Gradually, the ironmasters supporting the scheme have become impressed with the difficulties in the way of its adoption, and many of them eventually withdrew their support. The scheme in its original form, therefore, has been abandoned. It is stated, however, that there is an intention to abolish the warrant store in its present form; but at the time of writing details of this project have not yet been received.

Ernst Boley, assistant to General Superintendent Miller, of the American Steel & Wire Co., Cleveland, has returned from an European trip.

METAL MARKETS

New York

Aug. 19.

Copper.—Although buying has eased up somewhat during the past few days, sellers are holding quotations at the top of the recent advance in copper prices. Books are well filled up to Oct. 1, and the outlook is that there will be no serious recession in the market in the next two or three months. It is generally conceded that the metal has not been as scarce as it is today since the squeeze of 1906, when the price rose to about 25c per pound. While it would be deplorable to allow a repetition of that year's market and it is not likely that it will occur—it would not be a surprise to see copper selling at 17c or 18c before the end of the current year. Domestic stocks are approximately as low as they were a year ago, and foreign supplies are about 30,000,000 pounds less. Unless statistics are altogether worthless, consumption has been greater than production, and until these factors are reversed there is nothing to stop the advance.

Leading producers are asking 15.87½c to 16c for electrolytic delivered. Lake is nominally 16.25c to 16.50c, with little metal in sight.

Tin.—Consumers have paid a premium of from ¼c to ¾c for early tin over the cost to import. The metal is closely held in this market and the price is quick to respond to any change in the London market, particularly when the latter advances. Since the active buying by American interests last week subsided foreign quotations have been easier, and at the close of business today London standard tin was quoted £1 lower than a week ago. In the local market spot and August tin have ranged between 42c and 41.37½c. The closing today is 41.37½c for spot, 41.25c for August and 41.00c for September. Arrivals since Aug. 1, aggregate 2,632 tons, and there are 1,730 tons afloat.

Chicago

Aug. 19.

New Metals.—Reports of shading on copper are vigorously denied although a good many consumers seem to feel that the present price is based on speculative conditions rather than upon actual buying. There has been another advance in sheet zinc and this commodity is now quoted at \$7.75 per 100 pounds, f. o. b. La Salle, Ill.

We quote dealers' selling prices f. o. b. Chicago as follows:

Lake copper, carload lots, 15½c; casting, 15½c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 5.65c; lead, desilverized, 4.45c; sheet zinc, \$7.75, f. o. b. La Salle, in car lots of 600 pound casks; pig tin, 42½c; Cookson's antimony, 8¾c, other grades, 7¾c.

Old Metals.—Most of the brass foundries are buying from hand to mouth and the volume of business is erratic. Copper and brass continue firm and the balance of the list is inactive.

We quote dealers' selling prices f. o. b. Chicago as follows:

Copper wire, crucible shapes, 13½c; copper bottoms, 12½c; heavy red brass, 12¾c; heavy yellow brass, 8½c; No. 1 red brass borings, 11½c; No. 1 yellow brass borings, 8c; brass clippings, 10½c; lead pipe, 4½c; zinc scrap, 4½c; tea lead, 4c; No. 1 aluminum, 17c; No. 1 pewter, 29½c; block tin pipe, 36½c; tin foil, 33c; linotype dross, 3¾c; electrotype dross, 3¾c; stereotype plates, 4¾c; stereotype dross, 3¾c.

Heavy Tonnage for Coaling Stations

To be Built at Panama—Bids on Section of Brooklyn Elevated—Fair Volume of Business

Fair offerings and bookings of fabricated steel are shown in the eastern market where leading companies are looking forward to continued improvement running into the fall. Sharp competition is still bringing low prices on the larger tonnages, but some improvement on the lighter work is reported. The award of the general contract for coaling stations along the Panama canal insures 10,000 tons of steel work for the fabricated shops and mills of the Steel Corporation. Bids went in this week on about 10,000 tons for another section of the elevated railroad extensions in Brooklyn.

A fair volume of business continues to be enjoyed by fabricators in the Pittsburgh district, and shops are well filled with orders. That the American Zinc & Chemical Co., recently organized as a subsidiary of the American Metal Co., Ltd., intends to erect its new plant at Burgettstown, Pa., at the earliest possible date, is indicated by the award of a contract for the first unit of buildings, involving 2,500 tons. About 15,000 tons of steel will be needed to complete contemplated buildings.

In the west, scattering orders for small tonnages continue to characterize the situation. The fabricating shops are well supplied with business. Their stocks of steel, which in some cases are considerable, were purchased at such prices that they do not feel inclined to cut their quotations very materially at present.

STRUCTURAL CONTRACTS AWARDED.

Lake Shore repair shop, Ashtabula, O., 1,100 tons, to the McClintic-Marshall Construction Co.

Wisconsin River Power Co., steel tainter gates and appurtenances, Prairie du Sac, Wis., 379 tons to the Lakeside Bridge & Steel Co.

Coca Cola Co., extension to building, Wabash avenue, Chicago, 684 tons to the Holmes Pyott Co.

Portland, Oregon, steel for public dock No. 1, 299 tons to the Northwest Steel Co.

Young Men's Institute, Lodge building, San Francisco, 500 tons to the Central Iron Wks.

Minnesota Steel Co., various buildings, New Duluth, Minn., 3,500 tons to the American Bridge Co.

Boiler plant for Semet Process Co., Syracuse, N. Y., 1,800 tons, placed with McClintic-Marshall Construction Co.

Recreation pier, Baltimore, 800 tons. General contract awarded to the Singer-Pentz Co., Baltimore, and steel work will go to American Bridge Co.

Buildings for American Zinc & Chemical Co., Burgettstown, Pa., initial unit, 2,500

tons, the McClintic-Marshall Construction Co. Power house, Semet-Solvay Co., Syracuse, N. Y., 1,800 tons, the McClintic-Marshall Construction Co.

Freight car repair shop, the Lake Shore & Michigan Southern railway, Ashtabula, O., 1,200 tons, McClintic-Marshall Construction Co.

Building for Aluminum Co. of America, Arnold, Pa., 400 tons, the McClintic-Marshall Construction Co.

Building for Arkansas Fertilizer Co., Little Rock, Ark., 350 tons, the McClintic-Marshall Construction Co.

Apartment for Princeton Construction Co., West Eighty-seventh street, New York City, 600 tons, to Ravitch Bros.

Building for New York Telephone Co., Troy, N. Y., 400 tons, to Eidlitz & Ross.

Apartment for Levey Construction Co.,

Seventy-first street and Lexington avenue, New York City, 600 tons, to the Passaic Structural Steel Co.

Coaling plants at Cristobal and Balboa, Panama canal, general contracts awarded to Augustus Smith and the Hunt Construction Co., New York City. Steel work, about 10,000 tons will be furnished by the United States Steel Products Co.

Apartment for Johnson & Kahn, Park avenue and Seventy-seventh street, New York City, 1,200 tons, placed with the Hinkle Iron Works.

CONTRACTS PENDING.

Kresge building, Detroit, 18 stories, 1,800 tons.

Repair shop for the Lake Shore railroad, Toledo, 1,200 tons.

Superior viaduct, Cleveland, 2,630 tons of reinforcing bars and 400 tons of shapes. Hunkin-Conkey Construction Co. low bidder.

Buildings for New Jersey Zinc Co., Palmerton, Pa., 1,100 tons. Bids entered.

School building, New York City, 600 tons. General contract awarded to the Stove Construction Co.

Royal Bank, Toronto, 3,000 tons. General contract awarded the Geo. A. Fuller Co. Bids being taken on the steel.

More Activity in Bridge Material

And Still Heavier Buying is Expected, But Orders Are Not Yet Numerous—Lull in Car Buying Continues

A more liberal attitude towards the purchasing of bridge requirements is being shown by certain eastern railroad systems, some of which are now again taking up these matters after having followed retrenchment policies for some months past. Among the railroads which are expected to enter the market more freely in the near future are the New Haven and the Boston & Maine systems. The former especially has an important program of grade crossing elimination to be carried out. One division alone will call for about 2,500 tons. The Maine Central bridge, Augusta, Me., 2,500 tons, has not been awarded and may be held up for awhile. In all directions there is a fair amount of bridge work, but the railroads are still buying equipment very sparingly. No rail orders for 1914 shipment have yet been placed, though a number of systems are working up their estimates. Some rail makers believe that the Pennsylvania system will be among the first of the leading roads to close its order. The Western Maryland has placed 1,200 kegs of spikes with the Jones & Laughlin Steel Co.

Swift & Co. are building 250 refrigerator cars at their own plant and are in the market for 250 more cars of the same character. The

Buenos Ayres & Pacific Railway Co., of Argentine, has sent a representative to Chicago to negotiate for the purchase of 150 refrigerator cars.

CAR AND LOCOMOTIVE ORDERS.

The San Antonio & Aransas Pass railroad has placed eight consolidation locomotives with the Baldwin Locomotive Works.

The Sandy River & Rangely Lakes railroad has ordered two switching locomotives from the Baldwin Locomotive Works.

The Grand Rapids & Indiana railway, 60 all steel gondolas, the Cambria Steel Co., Johnstown, Pa.

The San Antonio & Aransas Pass Railroad has ordered eight locomotives from the Baldwin Locomotive Co.

RAIL SALES AND INQUIRIES.

The Tampa & Gulf railway has placed 5,000 tons of rails with the Maryland Steel Co.

The Florida & East Coast railway has ordered 1,000 tons of rails of the Maryland Steel Co.

The Elkins & Allegheny railroad and the Los Angeles railways have ordered 500 tons of rails each from the Pennsylvania Steel Co.

The United States Steel Products Co. has taken an order for 6,000 tons of rails for a railroad in Brazil.

The United States Steel Products Co. has booked 3,000 tons of rails for shipment to a Japanese railroad.

The Carolina & Yadkin River Railroad has ordered 1,000 tons of rails from the Maryland Steel Co.

CAR ORDERS PENDING.

The Union Pacific is considering the construction of 500 to 1,000 all steel box cars.

The Lake Shore & Michigan Southern and other New York Central lines are definitely in the market for 204 passenger cars.

GOOD INCREASE

In Canadian Production of Finished Materials.

The Bureau of Statistics of the American Iron and Steel Institute has received from the manufacturers statistics of the production of steel ingots and castings and finished rolled forms of iron and steel in the Dominion of Canada in 1912; also statistics of the production of all kinds of pig iron in the first six months of 1913. For 1911 and previous years the statistics were compiled by the American Iron and Steel Association.

Steel Ingots and Castings

The production of all kinds of steel ingots and castings in Canada in 1912 was 853,031 gross tons, against 790,871 tons in 1911, an increase of 62,160 tons, or over 7.8 per cent. Bessemer and open-hearth steel ingots and castings were made in both 1911 and 1912, the production of Bessemer steel amounting to 207,569 tons in 1912, against 189,797 tons in 1911, an increase of 17,772 tons, or over 9.3 per cent, and the production of open-hearth steel amounting to 645,062 tons in 1912, against 601,074 tons in 1911, an increase of 43,988 tons, or over 7.3 per cent. Almost all the Bessemer steel made in the two years was in the form of ingots.

Of the total production of open-hearth steel in 1912, 617,061 tons were ingots and 28,001 tons were castings, against 581,222 tons of ingots and 19,852 tons of castings in 1911. In both years all the open-hearth ingots were made by the basic process, but the castings were made by both the acid and the basic process. The total production of all kinds of steel castings in 1912 was 32,239 tons, against 22,312 tons in 1911, an increase of 9,927 tons. Included in the figures for 1912 are 1,294 tons of alloy steel castings, as compared with 1,091 tons in 1911.

Finished Rolled Iron and Steel

The production of all kinds of finished rolled iron and steel in Canada in 1912 amounted to 861,224 tons, as compared with 781,924 tons in 1911, an increase of 79,300 tons, or over 10.1 per cent. The output in 1912 was the largest in the history of the Dominion. Of the total production about 109,012 tons were iron and about 752,212 tons were steel, against about 86,383 tons of iron and about 695,541 tons of steel in 1911.

In 1912, the output of steel rails amounted to 49.2 per cent of the total finished rolled production, against 46.1 per cent in 1911. The following table gives the production of all kinds of

rails from 1895 to 1912. The total for 1899 includes 135 tons of iron rails. Steel rails only were rolled in all years other than 1899.

Forged Iron and Steel

The total production of forged iron and steel by rolling mills and steel works in Canada in 1912 amounted to about 22,415 tons, of which about 867 tons were iron and about 21,548 tons were steel, as compared with about 18,832 tons in 1911, of which about 787 tons were iron and about 18,045 tons were steel.

Cut and Wire Nails

In 1912 the rolling mills and steel works in Canada which operated cut-nail or wire-nail factories produced about 788,190 kegs of steel cut nails and steel wire nails of 100 pounds each, against about 652,861 kegs in 1911.

The production of finished angle splice bars, tie plates, fish plates, and other rail joints and fastenings in Canada by rolling mills and steel works in 1912, all steel, not including spikes, bolts, nuts, and similar fastenings, amounted to 52,157 gross tons. Similar statistics for 1911 and prior years were not collected.

Active Rolling Mills and Steel Works

In 1912 there were 31 works in seven Provinces which made steel ingots or castings or rolled iron or steel into finished forms, against 28 works in seven Provinces in 1911, a gain of three works. Of the total in 1912 there were 21 works which rolled iron or steel into finished forms and 10 which made steel ingots or castings, but not finished forms of rolled iron or steel, while in 1911 the number of works which rolled iron or steel into finished forms was 22 and the number of works which did not roll finished forms was six. In 1912 there were four idle rolling mills and steel works—one in Quebec and three in Ontario. In 1911 there were three idle plants—one in Quebec and two in Ontario.

Of the 31 active rolling mills and steel works in 1912 six were located in Nova Scotia, eight in Quebec, 13 in Ontario, and one each in Alberta, Manitoba, New Brunswick and British Columbia. On Dec. 31 one plant was being built in Alberta.

New Steel Works

In 1912 four new steel casting plants were built in Canada, of which two are located in Ontario and two in Quebec. None of these plants is equipped with hot trains of rolls. In addition, on Dec. 31, 1912, one plant for the manufacture of merchant bars was being built at Redcliff, in the Province of Alberta.

OBITUARIES

General Edward F. Jones, of Binghamton, N. Y., manufacturer of scales and farming implements, died at his home in that city, Aug. 14, aged 85 years. Death was due to a stroke of apoplexy. He was a pioneer advertiser among American manufacturers and the slogan he coined for his business of "Jones—He Pays the Freight" made his plant and goods familiar by words throughout the country and contributed materially to the success of his enterprise. General Jones is known to history as the commander who took the first regiment to Washington in response to President Lincoln's call for volunteers, published April 15, 1861. While his regiment, the Sixth Massachusetts, was passing through the streets of Baltimore, it was set upon by a mob and several persons were killed, the first instance of actual bloodshed of the civil war. President Lincoln stated that had General Jones' troops not reached there when they did the national capitol would have been in the hands of the confederates in a few hours. After the war General Jones served two terms as lieutenant governor of New York. He was a native of Utica, N. Y., and was educated in the common schools of Leicester, Mass.

Edward Mendinhall, a retired iron manufacturer, died recently at Wilmington, Del., aged 80 years. The Mendinhall family had been identified with the Marshall Iron Co., Newport, Del., manufacturer of iron sheets. This plant is now being dismantled.

Roy J. Wise, secretary and general manager of the Globe Coal & Coke Co., Pittsburgh, is dead at his home in Wilkinsburg. He was formerly connected with the Keystone Coal & Coke Co.

Will Buy Canal Boats

The Lehigh Coal & Navigation Co., which operates canals in eastern Pennsylvania in connection with its coal properties, has entered the market for 21 steel canal boats. One of these boats is for quick delivery and 20 are to be completed by April 1 next. The boats will be about 90 feet in length and will call for from 50 to 75 tons of steel each, most of which will be plates.

The Canton Iron & Steel Works, Canton, Md., advises the mills, engines and shears have not been sold by the company, but that H. H. Light, Lebanon, Pa., has bought some of the boilers, floor plates, etc., in the damaged portion of the works.

IRON AND STEEL PRICES

Pig Iron PITTSBURGH

(Through This Year.)

Bessemer	\$16.65
Basic	15.15
No. 2 foundry	14.65 to 14.90
Malleable	14.90
Gray forge	14.40

The freight rate from valley points is 90c.

CLEVELAND

(Through this Year Delivered in City.)

No. 1 foundry	\$15.00 to 15.50
No. 2 foundry	14.75 to 15.00
No. 2 southern	15.10 to 15.35
Bessemer	16.40
Silveries 8 per cent silicon	20.05

CINCINNATI

(Third and Fourth Quarters.)

Southern foundry No. 1	\$14.75
Southern foundry No. 2	14.25
Southern foundry No. 3	13.75
Southern foundry No. 4	13.50
Southern gray forge	13.25 to 13.50
Mottled	13.25
Southern No. 1 soft	14.75
Southern No. 2 soft	14.25
Standard southern car wheel	27.25 to 27.75
Southern Ohio No. 2	15.20 to 15.70
Southern No. 3	14.70 to 15.20
Southern Ohio No. 4	14.45 to 14.95
Silveries 8 per cent silicon	18.20 to 18.70

(Freight from Ironton, \$1.20; from Birmingham, \$3.25.)

CHICAGO

(Delivered Chicago, this year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnace.)

Lake Superior char., No. 1 to 4	\$15.00
Northern foundry No. 2	15.00
Southern foundry No. 2	15.35
Jackson co. silveries, 8 per cent	19.40
Southern silveries, 5 per cent sil.	17.35
Alabama basic	15.35
Malleable	15.00

PHILADELPHIA

(Prompt and third quarter shipment delivered to consumer's plants, in Philadelphia and vicinity, unless otherwise specified.)

Northern No. 1X foundry	\$16.00 to 16.25
Northern No. 2X foundry	15.50 to 16.00
Northern No. 2 plain	15.25 to 15.50
Standard forge (Eastern Pa.)	14.50 to 14.75
Virginia No. 2X	15.80 to 16.05
Southern No. 2	15.00 to 15.50
Standard low phos., Phila.	23.00 to 23.50
Lebanon low phos., furnace	18.00
Malleable	16.25 to 16.50
Basic (Eastern and Central Pa.)	15.15 to 15.25

NEW YORK

(Prompt and third quarter delivery, prices based at Jersey City and tidewater.)

Northern No. 1X foundry	\$15.75 to 16.00
Northern No. 2X foundry	15.50 to 15.75
Northern No. 2 plain	15.25 to 15.50
Virginia No. 2X	16.10 to 16.35
Southern No. 2	15.25 to 15.75
Malleable	15.75 to 16.00
Gray forge	14.50 to 14.75

ST. LOUIS

(Throughout This Year.)

Southern No. 1	\$15.25
Southern No. 2	14.75
Southern No. 3	14.25
Southern No. 4	13.75

(Freight, Birmingham to St. Louis, \$3.75.)

BIRMINGHAM

(For southern delivery.)

No. 1 foundry	\$11.50
No. 2 foundry	11.00
No. 3 foundry	10.50
No. 4 foundry	10.25
Gray forge	10.25
Mottled	10.25
Standard basic	11.50
Off basic	11.00
Charcoal	25.00

BUFFALO

(Through this year, delivered in city.)

No. 1 foundry	\$14.00 to 14.50
No. 2X foundry	14.00 to 14.25
No. 2 plain	14.00
No. 3 foundry	13.75 to 14.00
Gray forge	13.75 to 14.00
Malleable	14.00 to 14.50
Basic	14.00 to 14.50
Charcoal	15.75 to 16.75
Charcoal (special brands)	16.50 to 17.50

Ferro Alloys

English and German 80 per cent ferro-manganese, prompt and forward delivery, \$55 to \$56 seaboard.

Fifty per cent ferro-silicon on contracts, \$75; Pittsburgh, or Philadelphia, for carloads; \$74 for larger lots and \$73 for 600 tons or more. Twelve to 13 per cent, \$26. Eleven to 12 per cent, \$25. Ten to 11 per cent,

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Denver	84½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, shapes and plates	80 cents

\$24. Nine to 10 per cent, \$23 f. o. b. Globe, Jisco and Ashland furnace. Freight to Pittsburgh, \$1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2,000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, \$2.16; to Youngstown, \$2.48; to Cleveland, \$2.57; to Detroit and Columbus, \$2.99; to Cincinnati, \$3.40; to Chicago and Milwaukee, \$4.00. Freight from Philadelphia and New York, 10 to 30 cents higher respectively.

Coke

AT THE OVENS.

Connellsville district:—		
Foundry coke	\$2.85 to 3.10	\$3.00 to 3.25
Furnace coke	2.50	2.50
Wise county district:—		
Foundry coke	\$2.75 to 3.00	\$2.75 to 3.00
Furnace coke	2.25 to 2.50	2.35 to 2.50
Pocahontas district:—		
Foundry coke	3.00	3.00
Furnace coke	2.60 to 2.75	2.60 to 2.75
New River district:—		
Foundry coke	\$3.25 to 3.50	\$3.25 to 3.50
Furnace coke	2.60 to 2.75	2.60 to 2.90

Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, prices are: Old range Bessemer, \$4.40; Mesabi Bessemer, \$4.15; old range non-Bessemer, \$3.60; Mesabi non-Bessemer, \$3.40; all at lower lake ports.

Foreign iron ores, 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania, furnace points range from 35 to 75 cents per ton.

Semi-Finished Material PITTSBURGH

For prompt and forward delivery, Bessemer 4 x 4 billets with 0.25 carbon and less, \$26.50 to \$27.00; open-hearth rolling billets, \$26.50 to \$27.00; Bessemer sheet and tin bars, \$27.50; open-hearth sheet bars, \$27.50 f. o. b. Pittsburgh and Youngstown. Forging billets, \$33, Pittsburgh. Wire rods, \$27.50 to \$28.00; muck bar, \$31, Pittsburgh.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity; 4 x 4-inch open-hearth and Bessemer rolling billets at \$26.50 to \$27.00, and forging billets at from \$31 to \$32; muck bar, \$28 to \$30.

Standard Shapes PITTSBURGH

Standard structural shapes, 1.45c. For extras see card of Sept. 1, 1909.

CHICAGO

Standard structural shapes, 15 inch and under, 1.63c.

PHILADELPHIA

Delivered to consumers in Philadelphia and vicinity. Standard structural shapes from eastern Pennsylvania mills, 1.55c to 1.60c. From Pittsburgh mills, 1.60c.

NEW YORK

Standard structural shapes delivered at New York by eastern Pennsylvania makers 1.61c to 1.66c. On forward delivery, Pittsburgh district makers are quoting from 1.56c to 1.61c, New York.

Plates

PITTSBURGH

Standard steel plates ¼ inch thick, 6¼ to 100 inches, 1.45c. For extras, see card of Sept. 1, 1909.

CHICAGO

Tank plates, 1¼ inch thick, 6¼ to 100 inches wide, 1.63c.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity. Tank plates from eastern Pennsylvania mills for prompt or forward delivery 1.60c to 1.65c. From Pittsburgh mills, tank plates, 1.60c to 1.65c.

NEW YORK

Steel plates, tank quality, for prompt and forward delivery at New York by eastern Pennsylvania makers, 1.61c to 1.66c. Pitts-

burgh makers are quoting 1.61c to 1.66c, New York.

Sheets and Tin Plate

PITTSBURGH

Table with 2 columns: Item description and Price range. Includes No. 28 black, No. 30 tin mill black, No. 28 galvanized, No. 10 blue annealed, No. 28 painted, corrugated, No. 28 galvanized, corrugated, and Tin plate, 100-pound cokes.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.90c.

Pipe and Boiler Tubes

PITTSBURGH

Table with 4 columns: Item description, Black But., Galv. Weld., and Price. Includes Steel, 3/4 to 3 inches and Iron, 3/4 to 2 1/2 inches.

BOILER TUBES

Table with 2 columns: Item description and Price. Includes Steel, 3 1/2 to 4 1/2 inches and Iron, 3 1/2 to 4 1/2 inches.

Other sizes of pipe and tubes take the usual advances as per official cards.

Rails and Track Material

PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound for Bessemer and 1.34c for open-hearth, carload lots; less than 500 tons 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c base, Pittsburgh; track bolts, 2.40c base, Pittsburgh.

Railroad spikes, 4 1/4, 5 and 5 1/2 and 9-16 inch, 1.70c.

CHICAGO

Light rails, carloads, 25 to 45-pounds, 1.25c, base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, \$22 and \$23; standard section relaying rails, subject to inspection, \$23 to \$24.

Track fastenings, f. o. b. Joliet:

Angle bars, 1.50c; railroad spikes, 1.75c to 1.70c; smaller size spikes, 1.85c base; track bolts, with square nuts, 2.20c to 2.25c.

Bars, Hoops and Bands

PITTSBURGH

Common iron bars, 1.60c to 1.65c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill.

Hoops in carload lots, 1.60c, Pittsburgh; in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Cold rolled and ground shafting, 60 to 62 per cent off in carloads and 55 to 57 per cent in less than carloads delivered in base territory.

CHICAGO

Bar iron, 1.45c to 1.50c; hard steel bars rerolled, 1.50c; soft steel bars, bands and small shapes, 1.58c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting, 58 per cent off list for carload lots, 53 per cent off for less than carloads.

PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars, 1.55c to 1.60c on contract and common bar iron, 1.32 1/2 c to 1.42 1/2 c. Prompt steel bars on mill shipments, 1.85c to 1.90c, delivered. Cut nails 1.90c to 1.95c, Philadelphia. Shafting 62 and 60 off in carloads and 57 and 55 off in less than carloads in base territory.

NEW YORK

Delivered in New York steel bars on contract from 1.56c to 1.61c, and common iron bars, 1.33c to 1.45c.

Bolts, Nuts and Rivets

Rivets

Button head structural rivets, 2.00c, Pittsburgh, cone head boiler rivets, 2.10c. Small rivets, 75, 10 and 10 off.

Structural rivets, Chicago, 2.03; boiler rivets, 0.10c extra.

Bolt and Nut Discounts

(Delivered within a 20-cent freight radius.)

Carriage bolts, 3/4 x 6 inches, small and shorter, rolled threads, 75 and 10; cut threads 75 and 5; larger and longer, 70 and 2 1/2.

Machine bolts with hot pressed nuts, 3/4 x 4 inches, smaller and shorter, rolled 75, 10 and 5; cut, 75 and 10; larger and longer, 70 and 7 1/2.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, \$5.70 off list; hot pressed hexagon blank or tapped, \$6.30.

Cold pressed C. & T. square, blank or tapped, \$5.70 off; hexagon, blank or tapped, 5/8-inch and larger, \$6.60 off; 1/2-inch and smaller, \$7.20 off.

Wire Products

PITTSBURGH

Wire nails, jobbers' carload lots, \$1.65; retailers' carload lots, \$1.70; cut nails (western makers), jobbers' lot, \$1.65; painted barb wire, jobbers' carload lots, \$1.65; retailers' carload lots, \$1.70; plain wire to jobbers in carloads, \$1.45; and to dealers in carloads, \$1.50; polished staples, \$1.65; galvanized staples, \$2.05.

CHICAGO

Wire nails, jobbers' carload lots, \$1.83; retailers' carload lots, \$1.88; retailers' less than carload lots, \$1.93; painted barb wire, jobbers' carload lots, \$1.83; retailers' carload lots, \$1.88; retailers' less than carload lots, \$1.93; with 40c for galvanizing; plain wire, jobbers' carload lots, \$1.63; retailers' carload lots, \$1.68.

Cast Iron Pipe

CHICAGO

Four-inch water pipe, \$28; 6 to 12 inches, \$27; larger sizes, \$25; gas pipe, \$1 a ton higher.

NEW YORK

Six-inch pipe, 30 pounds to the foot, \$23 to \$25, f. o. b. New York, in carload lots.

BIRMINGHAM

Water mains: 4-inch, \$21.50; 6-inch and up, \$20.50. Gas main: \$1 per ton higher than water main. Special fittings, \$47.50 to \$52.50.

Old Material

PITTSBURGH

(Gross tons delivered.)

Table with 2 columns: Item description and Price range. Includes Heavy melting scrap, Rerolling rails, Malleable, Bundled sheet scrap, Iron axles, Old iron rails, Stove plate, No. 1 wrought scrap, Old car wheels, Low phosphorus, Machine shop turnings, No. 1 busheling, Cast borings, and No. 1 cast scrap.

PHILADELPHIA

Gross tons delivered to consumers' plants

in eastern Pennsylvania and western New Jersey:

Table with 2 columns: Item description and Price range. Includes Old iron rails (nominal), Old steel rails (rerolling), No. 1 heavy melting steel, Old car wheels, Old iron axles (nominal), Old steel axles (nominal), No. 1 railroad wrought, Wrought pipe, Cast borings, Machine shop turnings, Heavy cast (broken), Malleable, Stove plate, and No. 1 forge (nominal).

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: \$0.60 to Ivy Rock, Pa.; \$0.65 to Phoenixville, Pa.; \$0.80 to Coatesville, Pa.; \$0.85 to Bethlehem, Pa., Reading, Pa., and Roebuck, N. J.; \$1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; \$1.20 to Harrisburg, Pa.; \$1.40 to Milton, Pa.

CLEVELAND

Gross Tons

Table with 2 columns: Item description and Price range. Includes Old iron rails, Old steel rails (under 3 ft.), Old steel rails (over 6 ft.), Relaying rails, Old steel boiler plate, Malleable iron (railroad), Axle turnings, Steel axles, Malleable iron (agricultural), Heavy steel, Country mixed steel, and Bundled sheet scrap.

Net Tons

Table with 2 columns: Item description and Price range. Includes No. 1 R. R. wrought, No. 1 busheling, No. 1 machine cast, No. 1 dealers' wrought, Machine shop turnings, Pipes and flues, Wrought drillings, Cast borings, Stove plate, Wrought iron arch bars, and Wrought iron piling plate.

CHICAGO

(Delivered in consumers' yards.)

Gross Tons

Table with 2 columns: Item description and Price range. Includes Old car wheels, Old iron rails, Rerolling rails (5 ft. and over), Old steel rails (3 ft. and und.), Frogs, switches and guards, Heavy melting steel, and Shoveling steel.

Net Tons

Table with 2 columns: Item description and Price range. Includes No. 1 R. R. wrought, No. 2 R. R. wrought, Arch bars and transoms, Knuckles, couplers and springs, Shafting, Iron car axles, Steel car axles, Locomotive tires, Dealers' forge, Pipe and flues, No. 1 cast, No. 1 busheling, No. 2 busheling, No. 1 boiler cut, Boiler punchings, Cast and mixed borings, Machine shop turnings, Railroad malleable, Agricultural malleable, Angle bars, splices, etc., iron, Angle bars, steel, and Stove plate and light cast scrap.

NEW YORK

Gross tons, New York dealers' prices at tidewater, usually for Eastern Pennsylvania delivery:

Table with 2 columns: Item description and Price range. Includes Old car wheels (nominal), Heavy steel axles, Steel shafting, No. 1 heavy melting steel, No. 1 R. R. wrought, Wrought pipe (not galvanized), Cast borings, Machine shop turnings, and Heavy cast.

Stove plate 7.25 to 7.50
Grate bars 6.25 to 6.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are \$1.50 from Jersey City, and \$2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., \$1.50 from Jersey City, and \$1.80 from New York; to Bethlehem, Pa., \$1.10 from Jersey City, and \$1.60 from New York; to Roebing, N. J., \$1.00 from Jersey City, and \$1.50 from New York; to Milton, Pa., \$1.60 from Jersey City, and \$2.00 from New York; to Jersey City, \$1.00 from New York; to Newark, \$1.10 from New York.

CINCINNATI
Gross Tons.

Old iron rails \$11.50 to 12.00
Old steel re-rolling 10.00 to 10.50
Old iron axles 16.00 to 16.50
Heavy melting scrap 9.00 to 9.50
Relaying rails 18.75 to 19.25

Net Tons.

Old No. 1 R. R. wrought..... \$9.00 to 9.50
Bundled sheet scrap 5.00 to 5.50
No. 1 yard wrought..... 6.75 to 7.25
No. 1 machine cast 9.50 to 10.00
No. 1 busheling 7.00 to 7.50
Stove plate 6.75 to 7.25
Machine shop turnings..... 5.00 to 5.50
Cast borings 4.50 to 5.25
Heavy turnings 5.25 to 5.75
Mixed cast 7.75 to 8.25
Breakage 5.50 to 6.50
Malleable 7.00 to 7.50

BIRMINGHAM

Old iron axles, (light)..... \$15.00 to 15.50
Old steel axles (light)..... 15.00 to 15.50
Old iron rails 12.50 to 13.50
No. 1 R. R. wrought..... 12.00 to 12.50
No. 2 R. R. wrought..... 10.00 to 10.50
No. 1 country wrought..... 9.50 to 10.00
No. 2 country wrought..... 8.50 to 9.00
No. 1 machinery cast 10.00 to 10.50
No. 1 steel scrap 10.50 to 11.00
Standard car wheels 12.00 to 12.50
Tram car wheels 10.50 to 11.00
Light cast and stove plate..... 8.25 to 8.75

BUFFALO
Gross Tons

Heavy melting steel..... \$11.00 to 11.50
No. 1 R. R. wrought scrap... 13.00 to 13.50
No. 1 R. R. and mch. cast scrap 13.00 to 13.50
Old steel axles 17.00 to 17.50
Old iron axles 22.50 to 23.00
Car wheels 13.00 to 13.50
Railroad malleable scrap 12.00 to 12.50
Wright iron and soft steel turn. 6.00 to 6.50
Cast iron borings 6.25 to 6.75
Low phos. steel scrap..... 16.50 to 17.00
Old iron rails 15.00 to 15.50
Boiler plate, sheared 12.50 to 13.25
Bundled sheet scrap 8.00 to 8.50
Stove plate (net ton)..... 9.75 to 10.00
Locomotive grate bars 10.00 to 10.50
No. 1 busheling scrap..... 10.50 to 11.00
No. 2 busheling scrap 8.00 to 8.50

ST. LOUIS

(Dealers' buying prices.)

Gross Tons

Old car wheels \$12.00 to 12.50
Old iron rails 11.00 to 11.50
Re-rolling rails (5 ft. and over) 12.50 to 12.75
Old steel rails (3 ft. and under) 11.00 to 11.50
Light sec. relayers (45 pounds and und.) subject to inspec. 24.00 to 24.50
Relaying rails, subject to inspec. 24.00 to 24.50
Frogs, switches and guards..... 11.00 to 11.50
No. 1 R. R. heavy melting steel 11.00 to 11.50
Shoveling steel 10.00 to 10.50

Net Tons

No. 1 railroad wrought..... \$10.50 to 11.00
No. 2 railroad wrought..... 9.75 to 10.25
Arch bars and transoms..... 14.00 to 14.50
Knuckles, couplers, springs..... 10.00 to 10.50
Shafting 13.50 to 14.00
Steel car axles 15.50 to 16.00
Iron car axles 19.50 to 20.00
Locomotive tires 11.00 to 11.50
Pipe and flues 7.00 to 7.50
Tank iron and cut boilers..... 7.00 to 7.50
No. 1 cut busheling 9.00 to 9.50
Cast and mixed borings 4.00 to 4.50
Machine shop turnings..... 5.50 to 6.00
Railroad malleable 9.00 to 9.50
Agricultural, malleable 7.00 to 7.50
Stove plates 7.50 to 8.00
Angle splice bars (iron)..... 10.50 to 11.00
Angle splice bars (steel)..... 9.50 to 10.00

Store Prices
CINCINNATI

Steel bars, 2.00c; iron bars, 1.90c; plates and shapes, 2.10c; sheets, blue annealed No. 10 2.20c to 2.25c; black, No. 28, 2.65c; galvanized, No. 28, 3.75c; cold rolled shafting, round, square, hexagon and flat, 50 off.

CLEVELAND

Steel bars, 2.00c; plates and shapes, 2.10c; iron bars, 2.00c; sheets, No. 16 blue annealed, 2.40c; No. 28 black, 2.85c; No. 28 galvanized, 3.95c.

CHICAGO

Steel bars, 1.85c; iron bars, 1.85c; hoops, 2.50c; shapes and plates, 1.95c; No. 10 blue annealed sheets, 2.15c, black, No. 28, 2.80c; galvanized, No. 28, 4.00c.

PHILADELPHIA

Steel bars, 2.00c to 2.05c; structural shapes, 2.00c to 2.10c; plates, 2.00c to 2.10c.

NEW YORK

Steel bars, 2.05c; structural shapes, 2.15c; plates, 2.15c.

SOUTHERN MARKET

Making a Good Showing—Recent Sales at Good Prices.

New York, Aug. 20. (By wire.)—The southern iron market is showing up strongly and the heaviest sales yet made at \$11 basis are reported by different leading sellers for the past week. One maker took about 20,000 tons of basic, including one lot of 10,000 and two of 5,000 tons each, all at \$11. A southern steel company took one of the 5,000-ton lots. A sale of 6,000 tons of foundry was made to a pipe maker in the Birmingham district at \$11 for No. 2. The International Harvester Co. is understood to be in the market for about 5,000 tons of foundry for Auburn, N. Y.

Rails and Bridges

New York, Aug. 20. (By wire.)—The Pennsylvania lines west have awarded 3,000 tons of bridge work to the American Bridge Co.

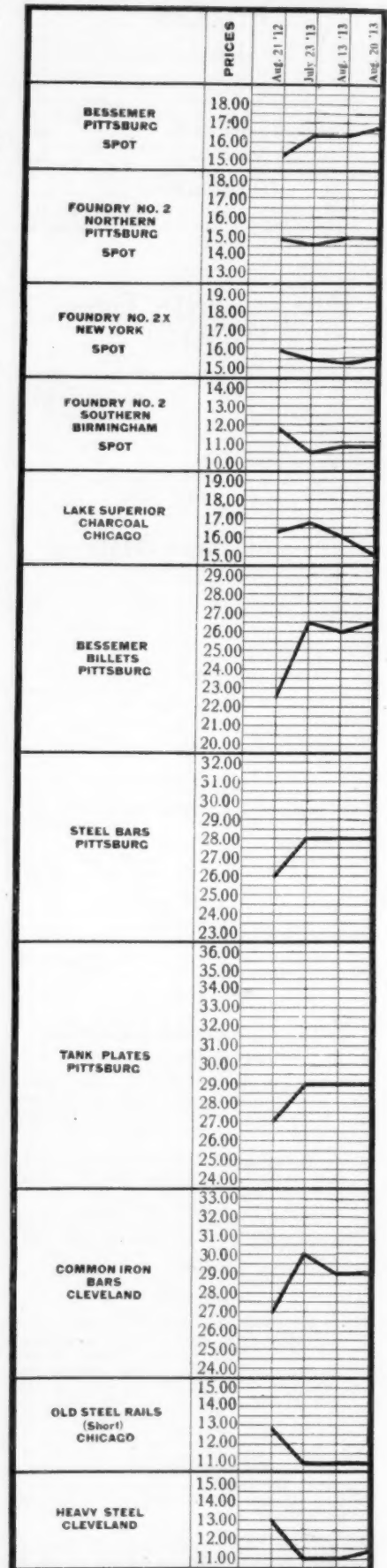
A high school at Hartford, 500 tons, has gone to the Phoenix Iron Works.

The Illinois Steel Co. reports about 5,000 tons in small rail orders.

Death of J. Stephen Jeans, Writer on Iron and Steel

The death of J. Stephen Jeans, formerly secretary of the Iron and Steel Institute of London, for years editor and one of the proprietors of *The Iron and Coal Trades Review*, and a well-known writer upon topic associated with the iron and steel trades, is announced, at the age of 67 years.

PRICE CHART



How Flexible Steel Belting is Manufactured

Description of the Special Machines Employed, the Forming and Assembling Operations—Tests of the Belt and Its Application

Flexible steel belting is a new product manufactured by the recently-organized Flexible Steel Belting Co., Bridgeport, Conn. The belt is of the linked type, and is the invention of Henry A. House Sr., Bridgeport. It is made to fit all pulleys from diameters of two inches up to the largest sizes, and can be used for nearly all purposes to which leather and rubber belting are adapted. It is designed especially for main drives and for service where the atmospheric or other conditions are severe on leather and rubber belting.

Flexible steel belting is made in one standard and two special sizes. The standard size is made of links one inch wide, ten of which constitute a length of one foot and is adapted for pulleys 8 inches in diameter or larger. The special belting is made of links one inch wide and 14 per foot, and of links $\frac{3}{4}$ inch wide and 14 per foot, both being employed for pulleys 2 inches in diameter and larger. The method of assembling the links, however, is the same in each case. The parts, constituting the link, shown in Fig. 5, consist of a bow-link, 1; shield, 2; diamond bar, 3; drag links, 4, and a soft steel cotter, 5, for locking the ends of the pins.

In the standard belting, the com-

bined width of the bow and drag links is one inch. In assembling the belting, therefore, the desired width is secured by taking one bow for

in the edges of the pin at the opposite end in which the cotter is inserted. The latter is then bent over by pliers, as shown in Fig. 8, thus locking the links in place.

The chief feature of flexible steel belting is the method of holding the links together by means of knife edge bearings. The knife-edges of the steel pins are hardened to a glass finish, and these edges bear against the concave interiors of the hardened steel bearings.

For making the bow-links, cold-rolled spring steel, 0.016 inch thick, is employed. For the shield, high carbon steel is used, this being hardened and heat-treated after being formed. The drag link is made of 0.40 per cent carbon, cold-rolled steel and is subjected to heat-treatment. Open-hearth steel containing 0.15 per cent carbon, suitable for case hardening, is used for the diamond bars. The cotters are made of medium, cold-rolled Bessemer steel which will bend easily. All of this stock is purchased in the form of coils, which are mounted upon reels and from these are fed to the various machines.

The machines for stamping and bending the various parts of the link are of special design and are arranged in units of four machines each. At present, two units are in operation, each of which has a capacity for pro-

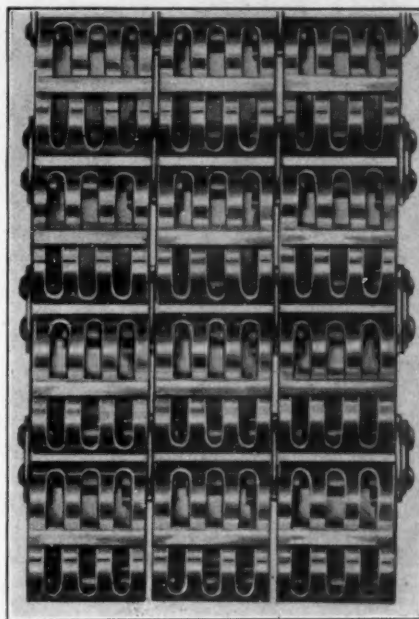


FIG. 1—A SECTION OF THREE-INCH BELT

each inch. The pins are slightly up-set at one end to keep the links from slipping off and two grooves are cut

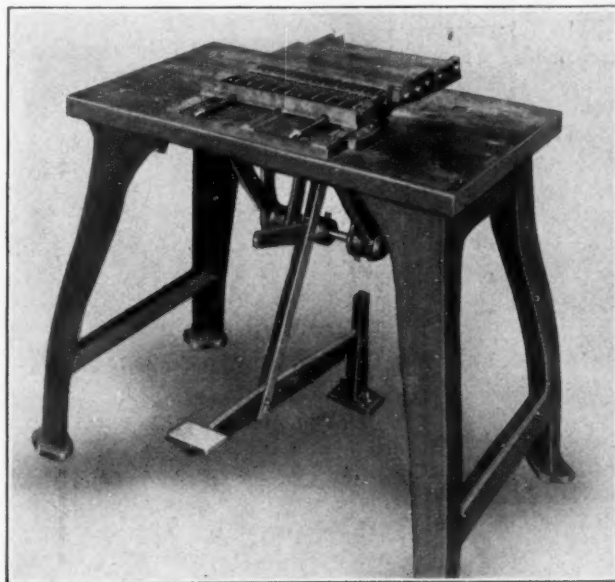


FIG. 2—SEMI-AUTOMATIC ASSEMBLING MACHINE, SHOWING METHOD OF INSERTING HARDENED STEEL BEARINGS IN THE BOW LINKS

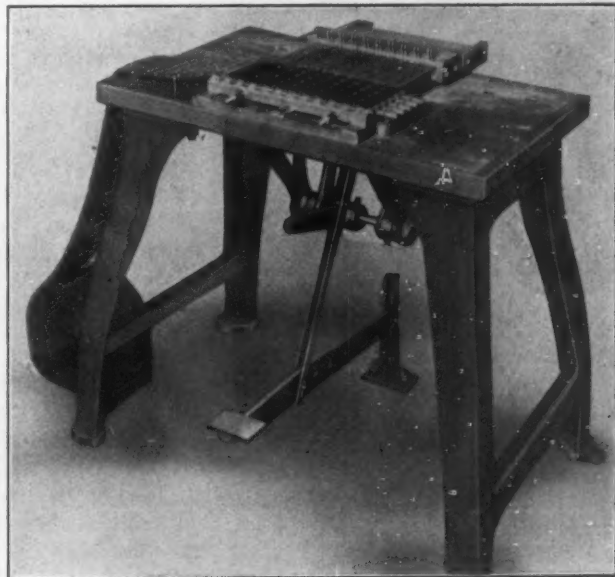


FIG. 3—ASSEMBLING MACHINE, SHOWING HOW A 5-INCH BELT IS ASSEMBLED

ducing 2,000 inch-feet of flexible steel belting per day.

The first of these machines, Fig. 6, is used to stamp and form the bow link and is a combination cam and toggle press. It is provided with a roll feed and has set edges to guide the metal, and a stripper. The metal is first pierced and cut off. Simultaneously with the cutting-off process, three tongues are cut out on one end of the piece, an offset being stamped in this end at the same time. The piece then is fed across the machine, the bottom being first concaved and the ends angled, after which the ends are folded over and clinched. The last operation consists of depressing the top of the bow link, after which the latter is ejected. The cross feed is a slide provided with two projecting arms which engage the blank on the forward movement. On the return, the arms drop down automatically in order to pass under the blank, coming up again to engage another blank on the next forward stroke. The folding is accomplished by two jaws which are pivoted on the same stud. The clinching is effected by three fingers which are contained in one of these jaws and which continue to move forward after the jaw has

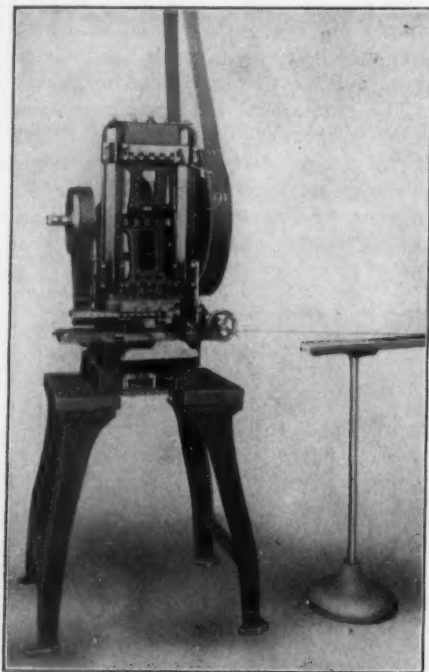


FIG. 4—SPECIAL MACHINE FOR UPSETTING, SLOTTING AND CUTTING OFF DIAMOND BAR PINS

completed its motion. The cross feed arbor is pivoted on a screw in the gate so as to allow it to drop at the return stroke of the press for the purpose of feeding the blank under the punch that depresses the top of the blank,

The second machine, which is designed for manufacturing the bearing links, also is a combination cam and toggle press. It operates on exactly the same principle as the first machine, with the exception that the curling of the center of the link is

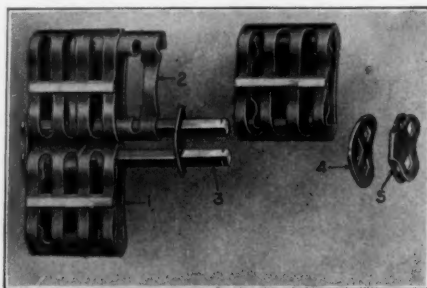


FIG. 5—VARIOUS PARTS OF THE LINK SHOWING HOW THEY ARE ASSEMBLED

accomplished by a vertical plunger whose movement is regulated by the movement of the toggle.

The third machine, Fig. 4, is used for forming the diamond bar pins. This is likewise a press of the combined cam and toggle type. The stock is fed to the machine by a friction roll and the first movement cuts off the pin and upsets it at one end; at the same time the other end is swaged slightly. Two slots are then sawed in the sides at the swaged end, after which the pins are ejected. The crosswise movement of the pins is accomplished by levers provided with pawls. The die-bed of the machine is provided with a number of grooved recesses, cut transversely. By means of V-blocks which are held in place in these recesses by set screws, the length of the pin is accurately regulated. The upsetting of the pin at one end is effected by vertical pressure on the upsetter, which is in the form of a block secured in one of the grooved recesses. Its position may be changed according to the length of the pin. Two of these pins are produced at each stroke of the machine and the three machines are operated at a speed of 50 strokes per minute.

After being heat-treated, the links are assembled into belting on a semi-automatic machine designed by Mr. House. This machine is used for two operations, namely, for forging the hardened steel bearings into the bow links, as shown in Fig. 2, and for assembling the complete links, as shown in Fig. 3. By the former operation, 10 links are assembled at one time, the bearings being pushed through tapered grooves into the bow links by depressing a foot lever.

For assembling the complete links, a number of jigs, one for each inch

of the width of the desired belt are employed. The last of these jigs is provided with a bolster for supporting the outside drag links, and which may be lowered for the purpose of putting the cotters on the ends of the pins. The latter are pushed along grooves in the surface of the bed plate of the machine by means of latches which are attached to the carriage or slide. The latter is operated by the foot treadle. The assembled belt is lifted out of the jigs by hand-operated lifting rods. As many more sections are added to this as are required to secure the desired length. This machine has a capacity for assembling 600 inch-feet of belting per day of 10 hours. About half of this length can be assembled by hand in the same period.

The fourth machine is a blanking press manufactured by the Baird Machine Co., Bridgeport, and is used for blanking the cotters and drag links. All the machines are provided with automatic stops, so that one man can look after an entire unit. The dies on these machines are interchangeable so that each unit can make either standard or special belting.

After they are formed, the various parts of the links are tumbled to re-



FIG. 6 — SPECIAL MACHINE FOR BLANKING, PIERCING AND FOLDING BOW LINKS

move burrs and fins, after which they are heat-treated. The bearing links are heated in a furnace to a temperature of about 1,400 degrees Fahr., after which they are dipped in oil and drawn to the proper temper. The diamond bars are first heated in lead

to about 1,200 degrees Fahr. and then are dipped in a cyanide bath, after which they are dropped in water, thus case-hardening them so that the knife edges have a glass finish. As it is essential to keep the pins from bending, they are held in individual holes in a frame or basket while passing through the lead and cyanide pots.

The bow links, cotters and drag links are heat-treated only sufficiently to retard rust.

Flexible steel belting recently was

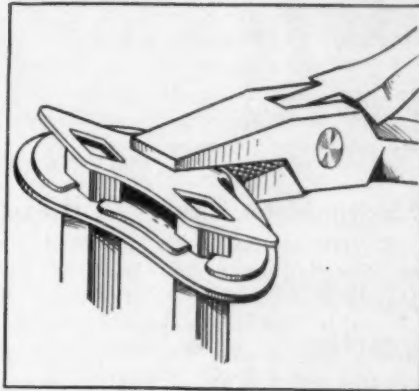


FIG. 8—METHOD OF LOCKING COTTERS ON PINS

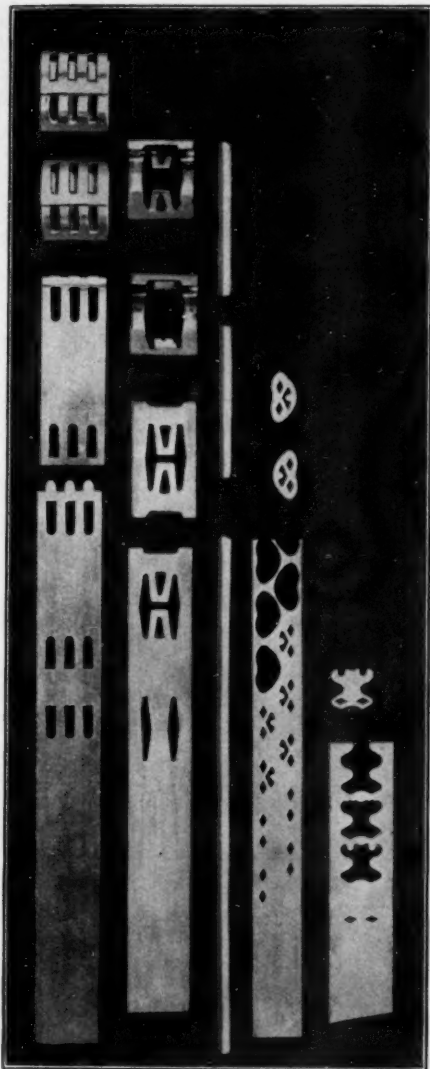


FIG. 7—HOW LINK PARTS ARE FORMED IN SPECIAL MACHINE

tested at the Massachusetts Institute of Technology in conjunction with new double leather belting and its performance in general was better than that of the latter. It showed a smaller percentage of slippage and, in the majority of tests, a higher efficiency than the leather belt. In operating at a low speed of 2,000 feet per minute, under a full load, the leather belt would not take as heavy a load as the steel belt. The test

showed that perfect alignment was unnecessary to the satisfactory operation of the steel belt. The steel belt showed remarkable elasticity in withstanding sudden strains or over-loads; it did not become heated at high speeds and ran smoothly when slack.

This belt has been tested in actual practice, one length having been operated as a main drive for over 2½ years and shows no appreciable signs of wear.

Flexible steel belting can be operated satisfactorily on flat or crown-faced pulleys, but in either case the pulleys must be lagged. For this purpose, split leather, about 3/16 inch thick, is recommended for ordinary use; it should be stretched on the pulley when damp and is best if glued or cemented and fastened with rivets or screws, the heads being countersunk. When dry, the leather should be given a thorough coat of castor oil. When single leather belting is used as a lagging, the rough side should, preferably, be out.

This belting should be put on with a fair tension, a take-up device, as

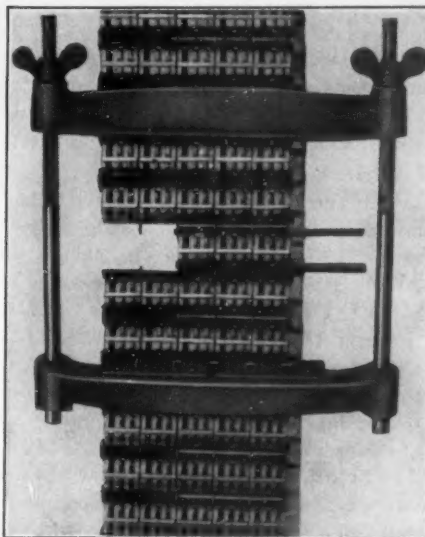


FIG. 9—METHOD OF USING THE BELT TAKE-UP

shown in Fig. 9, being supplied for that purpose. This device may be used for taking up the belt after it has been put on the pulley and for replacing links that have been broken or damaged. The belt should never be crowded-on over the edge of the pulley as it is flexible only lengthwise and not crosswise.

The Flexible Steel Belting Co.'s main office is at 141 Cannon street, Bridgeport. It also has opened a sales office at 50 Church street, New York City. The president of the company is William Wuthenow, and H. R. Leighton is secretary and treas-

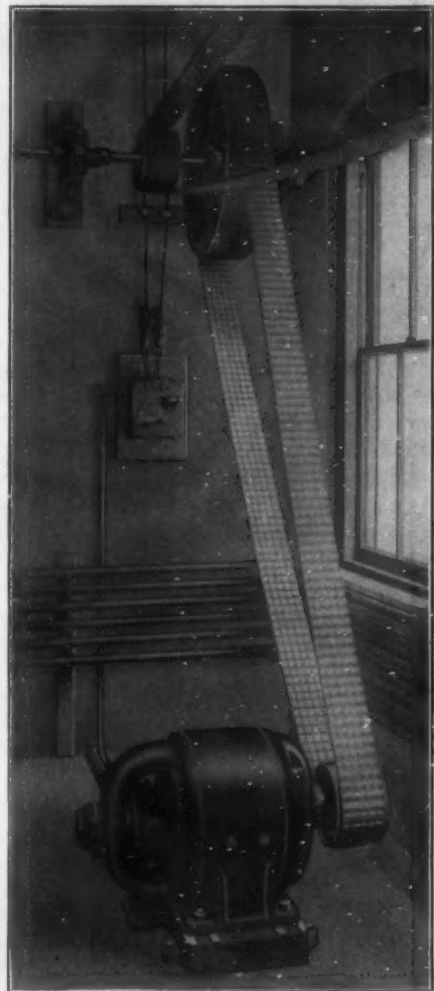


FIG. 10—APPLICATION OF FLEXIBLE STEEL BELTING

urer. Henry A. House Jr. is the company's mechanical engineer.

The value of the mine output of precious and semi-precious metals in Idaho in 1912 was \$21,466,521, against \$19,100,894 in 1911. The production of copper increased from 5,152,937 pounds, valued at \$644,117, in 1911, to 7,492,152 pounds, valued at \$1,236,205, in 1912. The lead production in 1912 was 284,185,657 pounds, valued at \$12,788,355, an increase of 11,629,132 pounds.



THREADING DIE MANUFACTURED BY
THE PIPE MACHINERY CO.,
CLEVELAND

Die for Threading Open-Hearth Steel Pipe

A die, especially designed for threading open-hearth steel pipe, manufactured by the Pipe Machinery Co., Cleveland, is shown in the accompanying illustration. It is adapted for use on power machines designed for threading open-hearth and Bessemer steel or wrought iron pipe. The die is of the expanding type, the chasers being opened and closed by a right and left spiral thread movement on the dies, by which they are encased on the sides. This design permits of the use of a large number of chasers, which divides the work to be done into small units without decreasing the production of the machine or increasing the labor, and also supports the pipe being threaded at a



FIG. 1—ELECTRICALLY-OPERATED
CLAM SHELL BUCKET IN
OPEN POSITION

large number of points on the circumference. This minimizes the liability of the pipe to split at the weld and prevents a single chaser from digging into the metal and destroying the thread being cut.

Electric Motor Clam Shell Bucket

A clam shell bucket operated by an electric motor and built by the Hayward Co., New York City, is shown in the accompanying illustrations. The closing of this bucket is effected entirely by an electric motor, which, together with a drum, disc clutch and automatic stop, is fastened to the upper head of the bucket by two bolts. The motor, electric brake gearing, etc., are enclosed in a casing which is provided with hand holes at one end for easy access to the working parts of the motor. By removing the two bolts which hold the casing to the head of the bucket, it may be

The opening and closing of the bucket is performed entirely by the motor, which usually is controlled by the crane operator. As the closing and opening of the bucket is accomplished independently of the operating mechanism, it therefore is necessary to have only one hoisting drum.

As indicated in Fig. 1, the bucket with its opening and closing mechanism is attached to the crane hook and can be readily removed when the work for which the bucket has been called into service has been finished. The load may be dumped as gradually as desired and without the shock of instantaneous discharge. The full load may be distributed over a number of different points, and this feature will prove of advantage in foundries when molding sand is being discharged into flasks too small to hold the entire contents of the bucket.

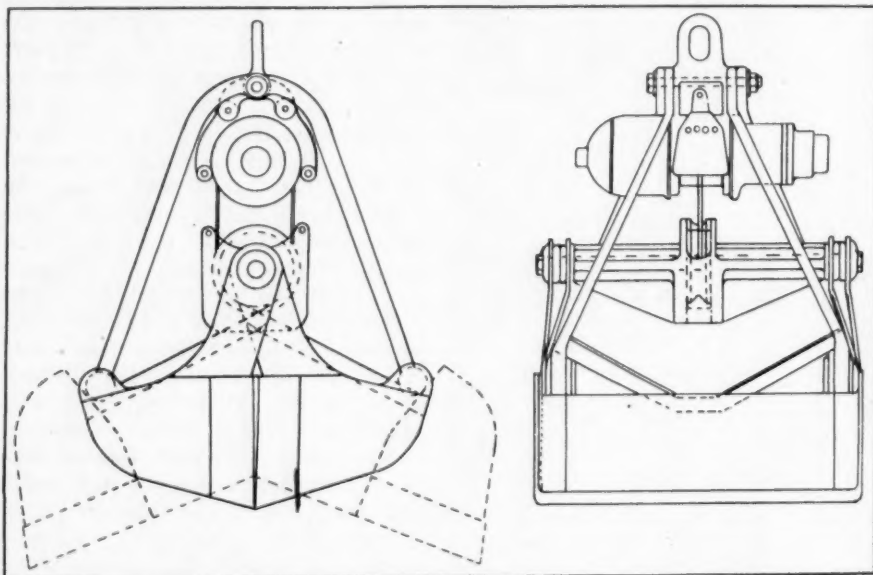


FIG. 2—END AND SIDE ELEVATION OF ELECTRICALLY-OPERATED CLAM SHELL BUCKET

entirely detached, and disconnecting four other bolts, divides the shell or casing in two parts, thereby leaving the operating parts entirely exposed.

Current is supplied through a thick cable, the strain on which is taken entirely by a snap hook which prevents the possibility of breaking the circuit through excess strain on the cable. On the shaft which passes through the blade arms is located a sheave encased in a casting, the latter performing the double duty of protecting the sheave and serving as a counterweight to open the bucket. The closing is accomplished by a two part wire rope line or chain, one end of which is fastened to the motor casing and passes over the sheave and back to the winding drum.

To prevent overloading the bucket, a disc clutch has been provided which is adjusted to slip before the danger point of overloading is reached. In the opening operation, when sufficient line has been wound out to open the bucket to its full extent, an automatic stop prevents the opening and closing line from re-winding on the drum. This stop is positive in action, a latch being thrown into engagement by the opening and closing line when the bucket is opened to its maximum spread. The automatic cable take-up reel is made to carry up to 500 feet of cable and may be located in any convenient position. This bucket is made in capacities from three-quarters cubic yard upward.

The Application and Care of Induction Motors

The Adaptability of These Machines With Pertinent Suggestions Influencing Their Selection—Damage-Proof Features

By C A Tupper

The increasing use, in and about iron mines, at blast furnaces, in steel mills, machine shops, pattern shops, foundries, etc., of squirrel cage induction motors, such as the standard types designed by any of the leading electrical manufacturers, has been brought about by their adaptability to three classes of service:

Driving constant speed machines.

Furnishing the power for apparatus requiring only such variation in speed as can be economically effected by mechanical means.

Operating short lines of shafting from which various accessory apparatus, shop tools, etc., can be operated.

There are a number of factors influencing the selection of induction motors of standard type, which may be summarized as follows:

(1) For most plants of any size power is now generated as alternating current; hence it can be utilized in induction motors, either directly or through the intermediary of static transformers; whereas in changing to direct current a motor-generator set or rotary converter needs to be kept in operation, with the expense and loss of power resulting therefrom.

(2) The motors are extremely simple in construction, having no rubbing surfaces or other points of contact except at the bearings; hence the cost of maintenance and attendance is far less than for any other type.

(3) They can be put on the line under load, even when a relatively high starting torque is required.

(4) They run at approximately constant speed, regardless of load, with only a slight drop between no load and full load; and if the load is suddenly thrown off no racing can occur.

(5) The voltage in the rotating part is so low that insulation breakdowns do not occur.

(6) The absence of commutator or brushes eliminates any sparking, flashing or burning, thus reducing the fire hazard.

(7) Such motors can be installed in places not readily accessible, being readily adapted to distance control.

In fact, with the exception of variation in speed, they have all of the advantages and none of the defects of the shunt-wound direct current motor, with other merits peculiarly their own.

Their very simplicity and ruggedness of construction, however, have led to abuses from operators in the way of lack of proper attendance. The following observations, therefore, are

made with the object of calling attention to some of the features of installation and care that are often neglected.

Induction motors, as ordinarily furnished by the makers, are assembled for floor or pedestal mounting; and if it is desired for convenience of service, to place them on wall or ceiling, this should be specified, so as to have the end housings, oil cups, etc., arranged accordingly.

The location of a motor is usually determined by that of the apparatus it has to drive; but if there is any choice in the matter, a place where there is good ventilation and freedom from dust and moisture should be selected. The equipment of a machine usually includes slide rails, to permit of adjustment in position. When these are placed, the supporting surface should be absolutely even, so that the machine rests properly on them. If a belt is used, this should run to the center of the pulley so that the rotor will not be forced out of its central position. When properly lined up, the rotor, when running, ought to oscillate freely in its bearings. There is no need of running with a tight belt; the belt tension should be just sufficient to avoid belt slippage; any greater tension puts an unnecessary strain on the belt and bearings.

Geared Motors

In case the motor is geared, see that the distance between centers of gears is correct, and that the pinion meshes properly with the gear. Slowly rotate the rotor and pass a thin piece of paper through the gears; the paper should show an even pressure across the full width of the tooth.

If the motor is small, use enclosed type fuses in connection with the starter, or, with the larger motors, use circuit-breakers. Fuses that are not out during starting should have current capacity at least two and one-half times that of the motor.

Trace all circuits, and be sure all connections are according to the proper diagram, before attempting to start a motor for the first time, as a wrong connection may result in burning out a part of the starter.

While the smallest induction motors can be safely started up by simply

closing the line circuit, thus requiring no auxiliary apparatus, for those of, say, 5 horsepower and larger, full applied voltage would cause an undesirable rush of current, resulting in large fluctuations in line voltage, and perhaps, interfering with the proper working of other apparatus connected to the supply mains. At standstill, the rotor acts as the short-circuited secondary of a static transformer, and the large rush of current that results from full applied voltage may damage the windings. It is necessary, therefore, to provide means for applying a reduced voltage at starting, and for changing over to full voltage after the motor has come up to speed. This is done by means of an auto starter.

Such starters are made in a number of different types and sizes to suit a wide range in voltage and output of the motors. The design and details of construction differ, but in all cases they comprise the essential elements of two single coil transformers, for reducing the voltage, and a switch for changing the connections between line, transformers and motors.

At starting, the switch connects the transformers to the line, and the motor to the transformers, the motor being tapped-in at a point that gives a voltage suited to the conditions under which it has to start. On the running position, the motor is connected directly to the line; and the circuit, through the transformers, is broken so that no current flows through them during the regular operation of the motor. The two transformers are each provided with taps, and by adjusting the tapping-in point the voltage, at starting, can be varied.

Starters are usually arranged to open the circuit in passing from starting to running, having only one starting point and they are designed so that it is impossible to move from off to running without passing through the starting position, or to introduce the starting connections in moving from running off.

The handles of most starters are moved in a clockwise direction to start and stop the motor, and can only be moved in the reverse direction to return, if desired from starting to off.

The practice of starting a motor by

throwing the power off and on is an extremely bad one. It results in burned contacts, and is sure to lead to trouble with the starter. When the starting handle has been placed on a starting position, it should be allowed to rest there for a short time, and then moved quickly to the next starting position or to running, as the case may be.

Motors are usually tested by the manufacturers under all conditions of load in mining or metallurgical service that can reasonably be expected to be imposed upon them, as well as for heavy temporary overloads, and it is customary to run them at the factory long enough to make sure that the bearings are satisfactory. If the motor is properly set up, there should be no trouble with the bearings, but, in case they show signs of heating, the cause always ought to be looked for at once. In setting-up a motor the oil wells should be carefully inspected to see that no dirt has gotten into them during shipment. If it is found that the oil wells have become dirty, they should be blown-out, and, if very dirty, washed-out with gasoline. After making sure they are clean, fill them with a good grade of mineral oil, preferably dynamo oil that is easy flowing and readily carried up by the oil rings. The use of graphite or similar lubricants is not desirable, as it clogs up the oil ducts, and also interferes with the operation of the oil rings.

Motor Lubrication

The level of the oil in the bearings, can be ascertained by throwing back the small lid that covers the oil well opening of the bearing, or, in case the bearings are provided with oil gages, the oil level is easily seen. Sufficient oil must be kept in the bearings at all times so that the rings will dip well below its surface. When the motor is first started examine the rings to see that they revolve and carry up oil. Examine the oil occasionally, and if it shows any signs of dirt or grit draw it off and replace with a fresh supply. Some of the most common causes of hot bearings are as follows: Poor grade of oil, grit and dust in oil well and bearings, foreign particles in oil grooves stopping circulation of oil, oil well not full, too tight or too heavy a belt, too much end thrust on rotor, sprung shaft, bab-bitt worn down or badly cut. The bearing surfaces in most motors are of ample area, and experience has shown that practically all trouble is due to faults either in the setting up of the machine, or in operation, rather than in the design or manufacture. The

bearings of induction motors should be given special attention, and, if possible, inspected daily. The air gap between stator and rotor is necessarily small in motors of this class, and an undue amount of wear in the bearings may allow the rotor to run on the stator. The air gap between stator and rotor should be examined frequently, and, if there is danger of rubbing, the bearings should be replaced by new ones. On some of the larger sizes of induction motors the bearings are made adjustable, so that the rotor can be shifted to secure a uniform air gap, but for the smaller sizes it has ordinarily been found more satisfactory to renew the linings, than to go to the expense and complication of adjustable bearings.

Needed Attention

While, as previously intimated, these motors will run with a minimum of attention, they should not on that account, be neglected, nor dust and grit be allowed to accumulate around the windings or bearings. Wipe the motor thoroughly at regular intervals, and blow-out the dust from all parts. If the motor has to operate in a damp place it is a good plan to occasionally give the projecting parts of the stator coils a coat of water-proof insulating varnish. Pay special attention to the bearings, and do not allow the oil in the oil wells to become dirty.

All motors become more or less warm after running for some time. Most are designed to carry full load continuously with a temperature rise not exceeding 40 degrees Cent. or 72 degrees Fahr. Should a motor feel hot to the touch, there is no occasion for alarm, because the core and windings may feel quite hot, and still be well below the allowable temperature rise; but if any excessive heating is noticed the cause should be looked for at once. It may be that the motor is overloaded, or the voltage applied to the motor terminals may be considerably higher than normal.

If an induction motor is loaded beyond a certain point it will stop or pull-out. In most standard 60-cycle type machines, 2 to 2½ times full load torque can be carried before the pulling-out point is reached. With 25-cycle motors the limit is from 2½ to 3 times full load torque. In both cases it is assumed full voltage is maintained at the motor terminals. Of course these large torques can be carried only for very short intervals, but if a motor is supplied with full line voltage, it will stand these momentary overloads without pulling out. If a motor pulls out it should at once be examined to see that it is not

overloaded. Examine the bearings and air gap to make sure there is no rubbing between rotor and stator. It may be that the stoppage is due to abnormally low voltage. The torque exerted by an induction motor decreases as the square of the applied voltage; hence a comparatively small drop in voltage produces a large decrease in torque, and, if the motor happens to be carrying a heavy load, at the time the decrease in voltage occurs, it may come to a standstill. To obtain the best service from an induction motor, it is important that full voltage be maintained. It is much better to have the voltage a little on the high side than on the low.

Standard motors are open, and while the end housings are designed so that they can be semi-enclosed by using screen cover, or totally enclosed by solid plates, such closing will make the motor run hotter because of the reduced ventilation. Motors intended for operation totally enclosed *require special winding*; and open motors, already in service, must not be equipped with tight covers. Open motors, however, can be equipped with perforated metal covers, and run at their regular rating; the temperature rise will, however, be from 10 to 15 degrees Cent. higher than for regular open motors of the same rating. When placing orders for machines the exact character of the service should be properly specified, in order that all of these points may be taken into consideration.

Damage-Proof Features

The extent to which induction motors are damage-proof, even from long submergence in water, was shown by the record of one installed at a well-known mine where there was a 35-horsepower motor driving a centrifugal pump, which became completely submerged during a flood, in consequence of the backing up of the adjacent river. In this condition, it remained 92 days. After the machine was taken from the water and the mud incasing it had been removed, it was merely covered with a tarpaulin and allowed to remain for some months in the open. Nothing further in the way of service was expected from the machine until it had been rebuilt. Later, however, there was emergency need of another motor, and the mechanical superintendent of the mine tested this machine. To his surprise, he found it all right, and it was at once placed in service. This occurred last fall. The motor continued running until the present spring, when it was again submerged and again put in service after the flood.

Electric Drive for Reversing Rolling Mills

Description of an English Installation for Operating a 30-Inch Cogging Mill and a 24-Inch Bar Mill

By James A Seager

One of the most difficult problems in the electrification of iron and steel works, is the manipulation of rolling mills owing to the necessity for frequent reversal of masses possessing high inertia. The value of electric drive, however, has been found to be of prime importance for this work, as the inherent qualities of the electric motor have great scope, owing to its power of dealing with overloads.

Moreover, the rapidity with which the direction of rotation may be reversed and the readiness with which the speed may be controlled have a most important bearing on the productive capacity of the mill.

A recent motor-driven installation, which, owing to its size and importance, ranks as one of the foremost in England, if not in the world, is at the Staffordshire steel and ingot iron works of Alfred Hickman, Ltd., where the Electric Construction Co., Ltd., Wolverhampton, has installed a complete plant consisting of a flywheel motor generator set, cogging mill and bar mill motor drive and the necessary control and safety devices for the mill motors and the live rolls.

By the utilization of a flywheel motor generator set the average load on the supply main is reduced to

one-fifth or even less of the maximum load on the mill motor. The control of the mill is extremely simple, the operations of rolling, reversing and speed regulation being governed by one lever. The power that the mill is absorbing may be read at a glance from a single instrument, while the total horsepower-hours per day or per shift can be read directly from an integrating meter, so that the cost

of rolling each section can be accurately determined.

It is well known that the peak loads on a mill motor are high compared with the average power consumed. In the Hickman plant the bar mill motor has to give peak loads of 6,000 horsepower for rolling, while the average power required by the mill is only about 1,000 horsepower, and the flywheel motor generator in

the dynamic accumulation of energy of electric rolling mill drive while still permitting quick reversibility. It consists of a motor generator, running at high speed, coupled to a heavy flywheel. The motor generator transforms the electric energy supplied by the central station into electrical energy at any voltage from zero to the maximum in either direction according to the speed and direction required by the mill motor.

When the mill motor requires energy for the peak load the speed of the motor generator set is allowed to drop by a special automatic regulator, the flywheel then supplying the extra power to the generator. When the power demand of the mill motor ceases the central station energy is absorbed by the flywheel while the set is rising to its maximum speed.

The Plant

The plant consists of a 30-inch cogging mill and a 24-inch bar mill, the electrical equipment including two reversing mill motors and a flywheel motor generator set. Contrary to continental practice the mills, although so large in size, are driven by single motors and the variable voltage generator and the motors work at a pressure of 1,000 volts in either direction. Under guar-

antee, the time of reversal for each mill motor has not to exceed six seconds from the maximum speed in one direction to the maximum speed in the opposite direction, and in practice this guarantee is well maintained.

The motor generator set consists of one motor, two flywheels and two generators, each generator being in direct electrical connection with its own mill motor. Fig. 1 shows a dia-

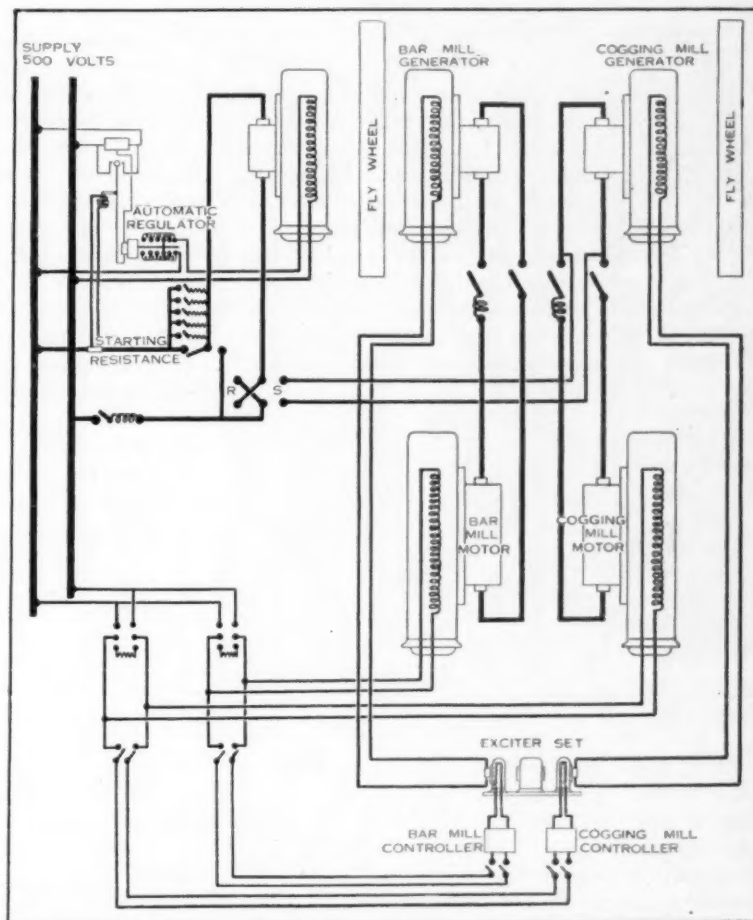


FIG. 1—DIAGRAM OF ELECTRICAL CONNECTIONS

this way solves the problem of how to obtain uniform load on the mains instead of the vastly fluctuating one offered by the mill motor. In the case of a non-reversing mill, the use of a flywheel on the mill motor itself is a direct solution of the problem, but where the mill has to be reversed promptly and often, this cannot be done and the flywheel motor generator is the obvious method of applying

gram of the connections which is practically self-explanatory. Power is supplied from the central station to the motor and the flywheel set at 460 to 500 volts pressure continuous current. The shunt-wound motor has a continuous working load capacity of 2,000 horsepower. The magnetic circuit of the motor is laminated throughout so that the speed answers directly to the automatic regulator. The generators are both separately excited and the efficiency of each of the three machines is 94½ per cent at full load. Each of the two flywheels is 14 feet in diameter, weighing 28 tons, the peripheral speed being about 15, 400 feet per minute. Each is built of three separate steel castings, machined and polished to reduce air friction losses. The maximum speed of the set is 350 revolutions per min-

flywheels to supply the power required to equalize the peaks in the load. To obtain this speed variation the motor in the flywheel set has a resistance in the shunt field magnet circuit, this resistance being varied by an automatic regulator operated by the current taken by the motor. This regulator comes into operation whenever the current input rises above or falls below the predetermined figure, and is guaranteed to equalize the load on the generating station to within 20 per cent of the average load. The cogging mill is used for cogging 2½-ton ingots to blooms, 4½ to 6 inches in section. The motor is connected to the rolls through 2 to 1 gearing, and will develop 4,800 horsepower at 1,000 volts for 5-second periods, six times per minute as a rolling load, and a maximum load

off the low tension supply. The speed and reversal of the mill motors is controlled by a system similar to the Ward-Leonard, the voltage of the generators being varied between the positive and negative maximum. The voltage variation of each generator is obtained by the operation of a single controller at the corresponding mill platform. This controller varies the field excitation of a small, motor-driven exciter, which in turn varies the excitation of this variable voltage generator. Each mill motor has a constant field excitation and the speed, therefore, depends on the voltage applied to the armature. Hence each position of the controller naturally corresponds to a definite speed in its mill motor. The controller used does not deal with a current greater than one ampere, which is a great advantage, as manipulation is easy and there is no arcing. During two years continuous working the controllers in these mills have had no renewals or adjustment, and show no signs of such being necessary. With this system of control only a small amount of energy is lost in reversing the mill, since the energy spent in accelerating the rotating masses is largely returned in the form of electric energy when the speed is decreased.

Indicators

To insure safety, circuit breakers are placed in the main circuits, these breakers being mounted on the main switchboard. Moreover, switches which can be operated either by the mill driver or by the switchboard attendant are provided for breaking the field circuit of the generator and, in addition, it will be noted from the diagram of connections, Fig. 1, that these are so arranged as to make it impossible to excite the generator field unless the field of the corresponding motor has been previously excited. Indicators are provided on each mill platform showing the speed of the flywheel motor generator set and of the rolls while the speed of the flywheel set can also be read from an indicator on the switchboard.

The exciter set consists of two exciters coupled direct to, and driven by a 75-horsepower motor running at 1,500 revolutions per minute and connected to the 500-volt circuit. The armatures of the two exciters are each connected direct to the field circuits of the two variable voltage generators of the converter set and the current in the field circuit of the exciters is varied in magnitude and direction by the position of the controller handle.

For the control of the live roll motors a special type of controller has been designed giving a long range

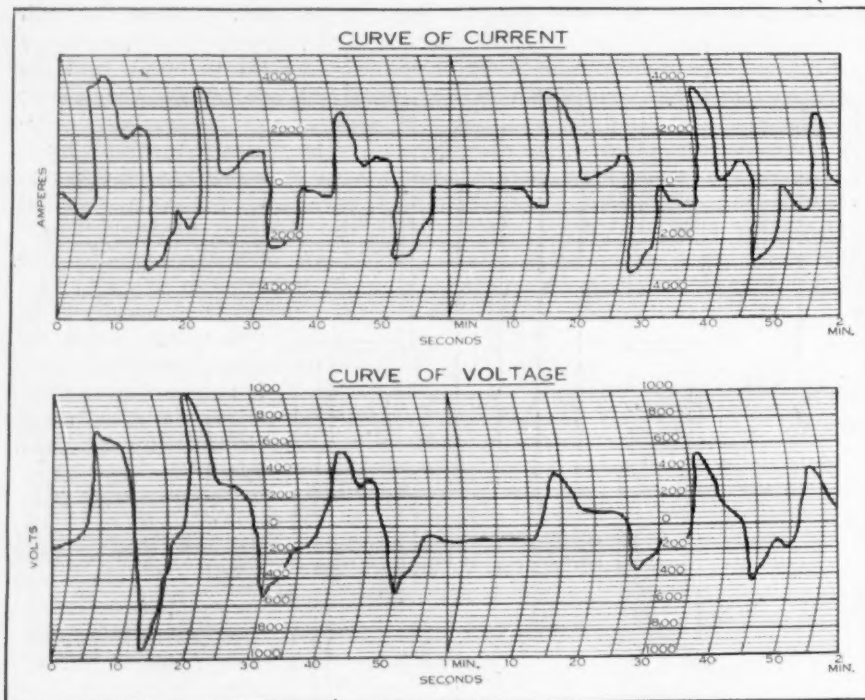


FIG. 2—TYPICAL CURRENT AND VOLTAGE CURVES

ute, while speed is decreased by the automatic regulator to 290 revolutions per minute. An arrangement is provided for starting the flywheel motor generator by connecting the armature of the cogging mill generator in series with the armature of the motor, this arrangement being economical in current consumption and in time required for starting, besides permitting a comparatively small starting resistance to be used. The motor of the set is excited from the low tension busbars and an efficient emergency electric brake is obtained by connecting this armature across the starting resistance.

The speed of the flywheel set is made to vary from 15 to 18 per cent below the maximum to enable the

of 9,600 horsepower for two-second periods once every hour. The speed of the motor is 120 revolutions per minute in either direction, at which speed the output is measured and it is excited off the low tension (460 to 500 volts) circuit.

The bar mill contains two sets of housings and rolls and is built for rolling sheet bars, billets, rounds, angles, etc. The motor is placed in a light building to protect it from dust and is connected directly to the rolls. The motor will develop 6,000 horsepower for 5-second periods six times per minute under a maximum load of 1,200 horsepower for two seconds once in an hour. The speed of the motor is 120 revolutions per minute in either direction and it is excited

of speed with even acceleration. The controller, although of substantial construction, is convenient and easy to operate, and any wearing parts are accessible and capable of quick renewal.

An important point in this connection is the large amount of metallic oxide dust in the rolling mill, and in order to meet this the insulation of the controller is especially designed to

avoid all grounds and short circuits. Fig. 2 contains typical current and voltage curves, and the quick reversal of the motor in spite of the heavy work performed will be noted.

Overhead Expense Distribution¹

By Royal R Keely

All expenditure in any industry may be divided into three broad classes, labor, material, expense; or more broadly, direct and indirect expense. Direct expense may be defined as all that may be charged directly to the product; indirect expense as all other expense connected with the conduct of the business and which must be borne by the sale of the product.

In a foundry, for example, the labor applied directly in producing a length of cast iron water pipe is called direct labor expense; that is, it is the labor applied directly to the product of this piece of pipe and is in no way related to other articles that may be produced. The pig iron required in making the length of pipe is direct stores expense. Other labor connected with the administration or supervision is classed as indirect expense. Stores required for repair of building and equipment, office supplies, etc., are classed as indirect stores expense.

In order that the management may intelligently conduct any business, the cost of each article of product should be known. In determining the cost of the length of cast iron pipe referred to, the labor applied directly in making it, as for instance, the setting up of the mold, pouring of the metal, removing of the pipe from the mold and cleaning it of sand, etc., and the pig iron entering into it, may be charged directly to its cost. But since all expense of the conduct of the business must be borne by the product, this individual length of pipe must bear its share of the expense of supervision, taxes, insurance, depreciation, repairs, heat, light and power, selling and advertising, general office expense, etc.

The determination of just what its share of these expenses should be has aroused much controversy, and there are in use today six methods of determining this indirect or overhead expense; (a) in proportion to material used; (b) in proportion to the direct

labor charge; (c) the time or number of man-hours employed in production; (d) machine rates; (e) cost numbers or factors; (f) prorating by inspection or judgment.

The first of these may be satisfactory if the product is homogeneous, as brick from a brickyard, where if any one kind of brick constitutes one-tenth the product of the plant, this will take one-tenth of the total overhead expense.

The second, that of apportioning expense according to wages paid, is very generally used. Here, if the direct wages paid on any kind of cast iron pipe are one-tenth the total direct wages for the foundry, then this kind of pipe bears one-tenth of the total overhead expense. The objection to the method is that a job produced by a 40-cent man at a vise and bench would bear the same proportion of overhead expense as one produced by the same man on a large and expensive machine. This method will be sufficiently accurate only in cases where the workplaces are all of nearly equal value and capacity and the workmen paid fairly uniform wages.

By the third method overhead expense is apportioned by the time spent on the job, instead of the value of the time, as in (b). It also does not take account of the equipment.

In the machine-hour, or the workplace-hour method, the rate is figured to include all expense of maintaining and operating the given workplace, a term broad enough to include everything, from an allotted area where a man may work with a monkey wrench or paint brush to the most complicated and costly machine in the shop.

In a modern office building the income-bearing unit is the office room to be rented, and in fixing the rental account must be taken of all the overhead expense. In a machine shop, each workplace may be regarded as enclosed by four imaginary walls, forming a room of suitable size for the performance of its operation. Each workplace is then considered as a unit in itself from which profit may be made in turning out a prod-

uct, or it may be rented to an individual workman.

If all the workplaces are rented, then the source of income is not on product sold, but altogether from rental or the available useful space of the manufacturing plant. All space, however, cannot be turned into rentable workplaces, for there must be general heat, light and power plant, storage space, aisles, halls, passages, offices, etc. The rented space, therefore, must not only maintain and operate the entire shop, but must produce a profit for the owners. Each workplace unit must bear its share of interest and depreciation on its building, interest and depreciation on the cost of machine, taxes, insurance, etc., on the investment, repairs and maintenance of building and equipment, its share of heat, light, power, etc., as well as all other general charges, if it is to make a profit for its owners.

The cost of the product from each workplace is made up of rental, raw material entering into the product, and a fair compensation for the worker, and the selling price must include his profits. The rental of each workplace must be a figure that will enable its operator to make a profit and must at the same time pay all the owner's expenses and make a profit besides. Provision must also be made for the idle time of a workplace.

This indicates the method of arriving at the machine rate. The method is superior to the others in that it takes account of the variation in the cost of production on different types of workplaces, and would be accurate if there were no idle hours. In any system the wages are carefully charged directly to the item of product, but since the general charges of interest, depreciation, insurance, etc., may be equal to or greater than the wages, it is important to cut these down to a minimum by putting as great a proportion as possible directly against the particular items of product, as in this method.

In the fifth method, that of cost numbers or factors, which is a simpler

¹From a paper presented at a meeting of the Philadelphia branch of the American Society of Mechanical Engineers.

system worked out by Frederick W. Taylor in his study of scientific management, the machine rates are determined by a process similar to that already described, and the rates are then treated not as a figure of value, but as a relative number called "relative cost numbers," or simply "cost numbers." If the cost of maintaining and operating two machines is three cents and three dollars per hour respectively, the cost numbers will be three and 300, respectively. The number of hours each machine runs on any job is multiplied by its cost number. At the end of the period, the total hours by cost numbers for each article or class of product on which it is desired to compute costs and also for the entire shop, are added together.

In general, a rate for apportioning the overhead expense can be established by this method for any class of product and the variation of the rate from period to period will give an accurate indication of the percentage of idle time in connection with this product. The disposal of all shop expense is now provided for. There will be few difficulties in the way of putting the direct labor and stores charge against the article of product into which it enters.

The writer generally accomplishes this result by assigning to the product and stores a definite, concise symbol for each size and kind. The mnemonic system of symbolization, as developed by Mr. Taylor, gives most excellent results. All expense in connection with the conduct of a business is divided, into (a) auxiliary, or "A" accounts, as power, stores, shipping, planning, etc.; (b) business office, or "B" accounts; (c) sales department, or "C" accounts; (d) manufacturing departments, or "D" accounts; (e) machinery and equipment, or "Y" accounts; (f) real estate, or "Z" accounts.

The expenses in connection with the A, D, Y and Z accounts are shop expenses and are disposed of by the method of hours by cost numbers, already described. B and C have no direct relation to shop costs and the expense of these departments may be disposed of by another method to be considered presently. All labor is apportioned by a system of job cards, time stamped at the beginning and again at the end of the job. The sum of the time shown on all these cards must equal the time for which the workman is paid. There is only one job on a card and each card bears the symbol of the product to which the time is charged. The stores are issued from the store room on

similar cards. During the period all job cards and stores issue cards are accumulated by symbol in a card index file. At the end of the period the total of all money paid, as represented by the cards, is drawn off by products.

In the classification of expense there is a symbol for each item of expense, both direct and indirect. The direct labor and stores can now be entered at once on the cost card for product turned out. The indirect labor and stores are entered on expense distribution cards, together with other indirect charges, as taxes, insurance, depreciation, etc.

The selling and business office expense, B and C, may be apportioned by a different method, either by direct shop cost, by wages, or by the time consumed in the manufacture of the product, according to the nature of the business. In some cases it may be merged with the shop expense and the total prorated by the method outlined. The usual method is by direct labor cost, or by hours of labor consumed in production.

The sixth method of apportioning the overhead expense, i. e., by inspection or judgment, is one in which the experience and judgment of officials of a company are used in putting this expense where it belongs.

To arrive at a practical method for doing this, the principal items of expense, which may include advertising, catalogs, correspondence, legal expense, patents, traveling expense, salesmen's salaries, drawings, etc., are listed and the expense of each apportioned to each class of product in proportion to the benefit derived, the proportion being determined from inspection. Thus, it may appear that advertising expense should be distributed among four different products as follows: 10 per cent to the product A, 20 per cent to the product B, 30 per cent to the product C, and 40 per cent to the product D. Product A may be an old and staple article, having a general demand, while D may be a new and patented article for which demand must be created by advertising.

If the profit on any class of product is exceptionally high or low, it will call for a careful examination of the direct and prorated charges. The direct charges of stores and labor are definite items and on these there can be little question. The indirect charges, especially those in connection with business administration, and selling, are intangible and hard to connect with any expense of manufacture, but it must be remembered that every dollar or expense, both

direct and indirect, must be borne by the product which is made and sold. The method of hours by cost numbers for all shop expense and that of apportioning by inspection for selling and business administration expense, are most generally applicable to the ordinary manufacturing establishment.

By-Product Coke in Illinois

The production of coke in Illinois in 1912 amounted to 1,764,944 short tons, valued at \$8,069,903, against 1,610,212 tons, valued at \$6,390,251, in 1911, according to E. W. Parker, of the United States Geological Survey. The average value per ton advanced from \$3.97 to \$4.57. In spite of the increase in production Illinois dropped from fourth to fifth place in rank among the states because of the much larger increase in Indiana that followed the putting in blast of the entire plant of 560 Koppers ovens of the United States Steel Corporation at Gary, which advanced that state from sixth to third place.

All the coke produced in Illinois in 1911 and 1912 was made in retort ovens, much of the coal being drawn from West Virginia mines; no beehive coke was produced in the state. In some of the ovens the charge consists of a mixture of West Virginia and Illinois coals in the proportions of 4 to 1. This has been found to make an entirely satisfactory coke. There were four retort plants, with a total of 568 ovens in operation in 1912. One of these plants consisted of 240 Semet-Solvay ovens, operated by the By-Products Coke Corporation at South Chicago. The plant has been enlarged three times, the latest addition of 40 ovens being completed in 1912.

Thirteen of the same kind of ovens were operated by the North Shore Gas Co., at Waukegan, having been completed in 1912. These ovens are heated by producer gas made from the coke. All the retort gas goes to the city mains.

A plant of 280 Koppers ovens was operated by the Illinois Steel Co., at Joliet, built in 1908 and 1909, and another of 35 by the Coal Products Mfg. Co., also at Joliet, completed in 1912. The surplus gas from the former is used at the steel plant and that from the latter is furnished to the city mains. Forty Semet-Solvay ovens were also under construction.

According to statistics recently issued by Henry R. Merton & Co., London, the copper production of the world in 1912 aggregated 1,004,485 tons, of which the United States produced 554,835 tons.

THE ABC OF IRON AND STEEL

The Rolling Mill Industry-III

By F H Kindl

RAILROAD axles are forged shafts having wheel seats and journals carrying the wheels, and supporting the truck or frame of locomotives, tenders or cars. Steel entering into the material from which axles are forged is made to conform to special specifications depending upon whether the axle is to be used for car or tender trucks, driving or engine trucks.

Railroad axles are forged in one heat, from blooms or billets, under a steam hammer, or high-speed forging press. After the forging process, they are transferred to the machine shop, where they are cut to length and centered. Frequently, axles are rough-turned in the same shop, and sometimes finished com-

plete ready to receive the wheels. Axles are tested for strength before being shipped, and must conform to certain specifications. After being tested, they are stamped with the melt number and initial of the maker. The plants manufacturing this class of forgings are called axle works, and are located close to the steel works, where the blanks or blooms are rolled.

Wheels, like axles, are produced in works specially equipped for this class of forging. There are numerous processes for forging wheels, but the common practice consists in pressing an octagonal ingot into a round slab. The slab is reheated, punched and pressed to the form of a wheel; this form is again re-

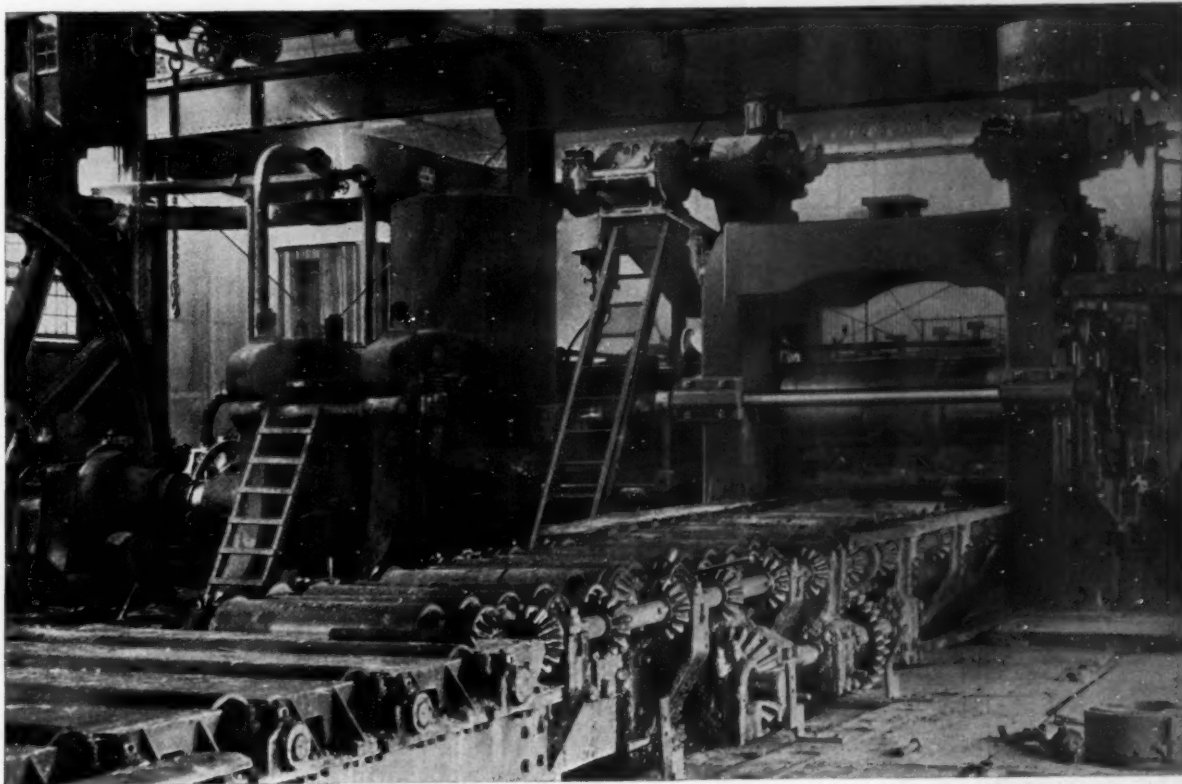


FIG. 17—THE 84-INCH PLATE MILL IN THE PLANT OF THE LA BELLE IRON WORKS, STEUBENVILLE, O.

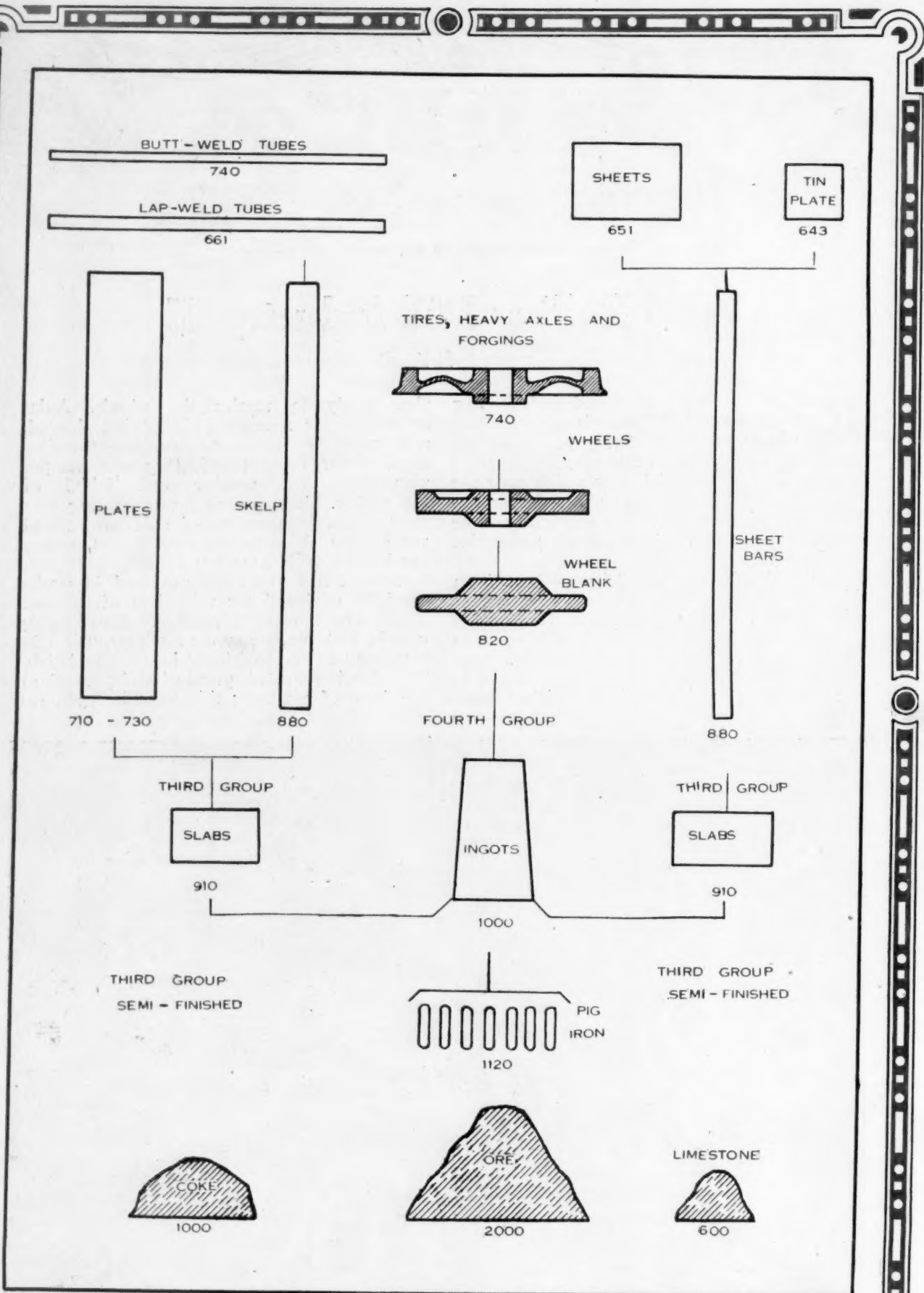


FIG. 18—PRODUCTION CONVERSION CHART, SHOWING THE WEIGHT IN POUNDS OF OPEN-HEARTH STEEL PRODUCTS OBTAINED FROM 2,000 POUNDS OF ORE

heated and placed in a specially constructed rolling mill, which gives the wheel its final shape. After leaving the rolling mill, the wheel is machined, bored and finished ready to be pressed on the axle. Special specifications govern the quality of steel from which the wheels are produced, and tests are made similar to those for axles.

Tires are circular forgings used to form the treads of wheels. They are shrunk to the outer rim of the wheels, and securely fastened thereto. They are forged from ingots of octagonal shape by pressing and punching to an annular form, and subsequently expanding the ring in a hydraulic press, and are finally rolled to shape. After rolling, the tire is turned to exact size in the machine

ments produced in pieces of considerable length in the process of drawing, in other words, successively reducing and extending, the section by repeatedly pulling it cold through tapered holes in a die plate. Most wire is of round cross-section, but it may also be square, flat, oval or have other forms, and is then known as shaped wire. Iron or steel wire is drawn down to 0.007 inch, or No. 34 B. W. G. or finer. The United States government has adopted the B. W. G. as standard for measuring the thickness, and classes all iron or steel rolled or drawn to a thickness of less than No. 6 B. W. G. (0.203 inch) as wire.

Wire may be produced from all ductile metals, but iron and steel wires have by far

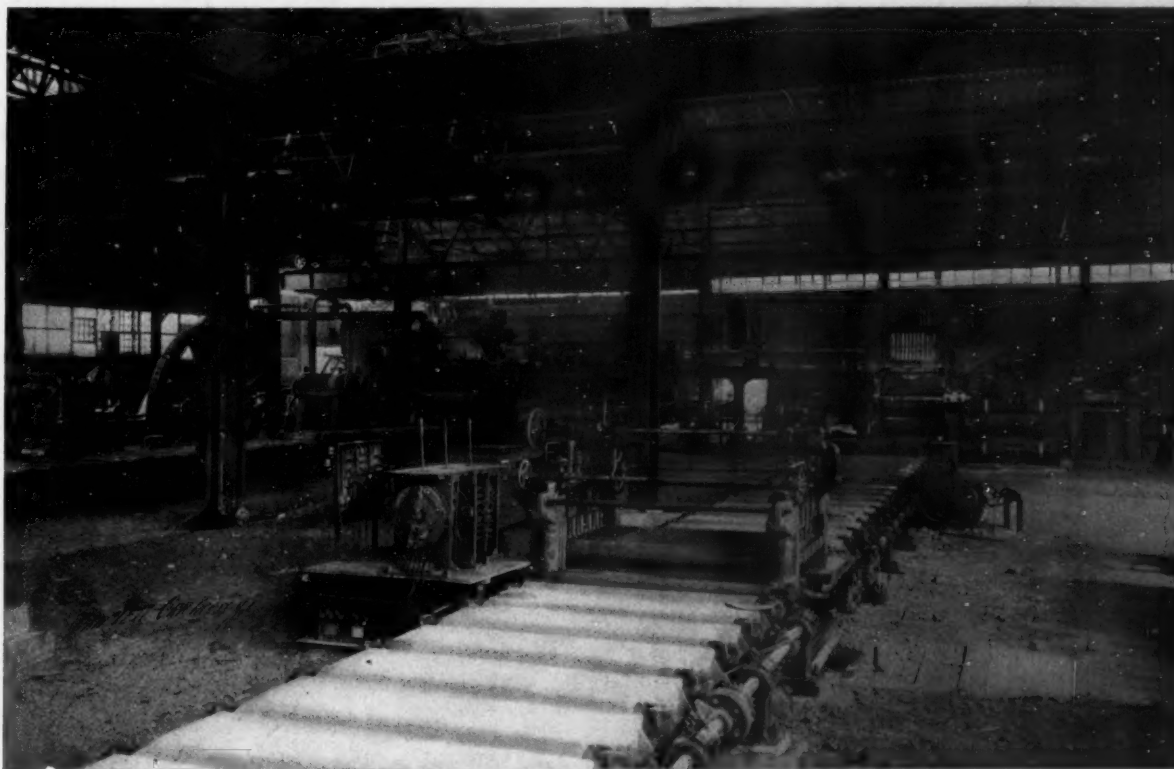


FIG. 19—PLATE MILL AND TABLES, LA BELLE IRON WORKS, STEUBENVILLE, O.

shop, and finished ready to be shrunk upon the wheel. The manufacture is carried on in separate shops with tools and appliances specially designed for the purpose, similar to that of wheels and axles.

Drop forgings is the product obtained by forging a suitable piece of steel between dies under a hammer, the lower die being attached to the anvil block, while the upper die is fastened to the hammer itself, and moves up and down with it. From the drop hammer, the forging is placed in a trimming press to remove the excess metal, called flash, before being machined. The process is used for the manufacture of articles in large quantities.

Wire is the name given to small metal fila-

ments produced in pieces of considerable length in the process of drawing, in other words, successively reducing and extending, the section by repeatedly pulling it cold through tapered holes in a die plate.

Most wire is of round cross-section, but it may also be square, flat, oval or have other forms, and is then known as shaped wire. Iron or steel wire is drawn down to 0.007 inch, or No. 34 B. W. G. or finer. The United States government has adopted the B. W. G. as standard for measuring the thickness, and classes all iron or steel rolled or drawn to a thickness of less than No. 6 B. W. G. (0.203 inch) as wire.

Wire may be produced from all ductile metals, but iron and steel wires have by far the greatest application and comprise nearly one-eighth of the entire iron and steel output. The main articles produced from wire are nails, spikes, barbed wire, wire rope, telegraph and telephone wire, coiled spring steel fence wire, chain wire, various forms of woven wire and wire netting, wire hoop, wire bale ties, springs, piano wire, rivets, screws, staples, tacks, etc. Large quantities of various classes of wire are used in the manufacture of articles for household and industrial purposes having innumerable applications.

The drawing of wire is performed in a drawbench, which consists of a die-plate and a driven reel for pulling the wire through the die. In order to reduce the friction

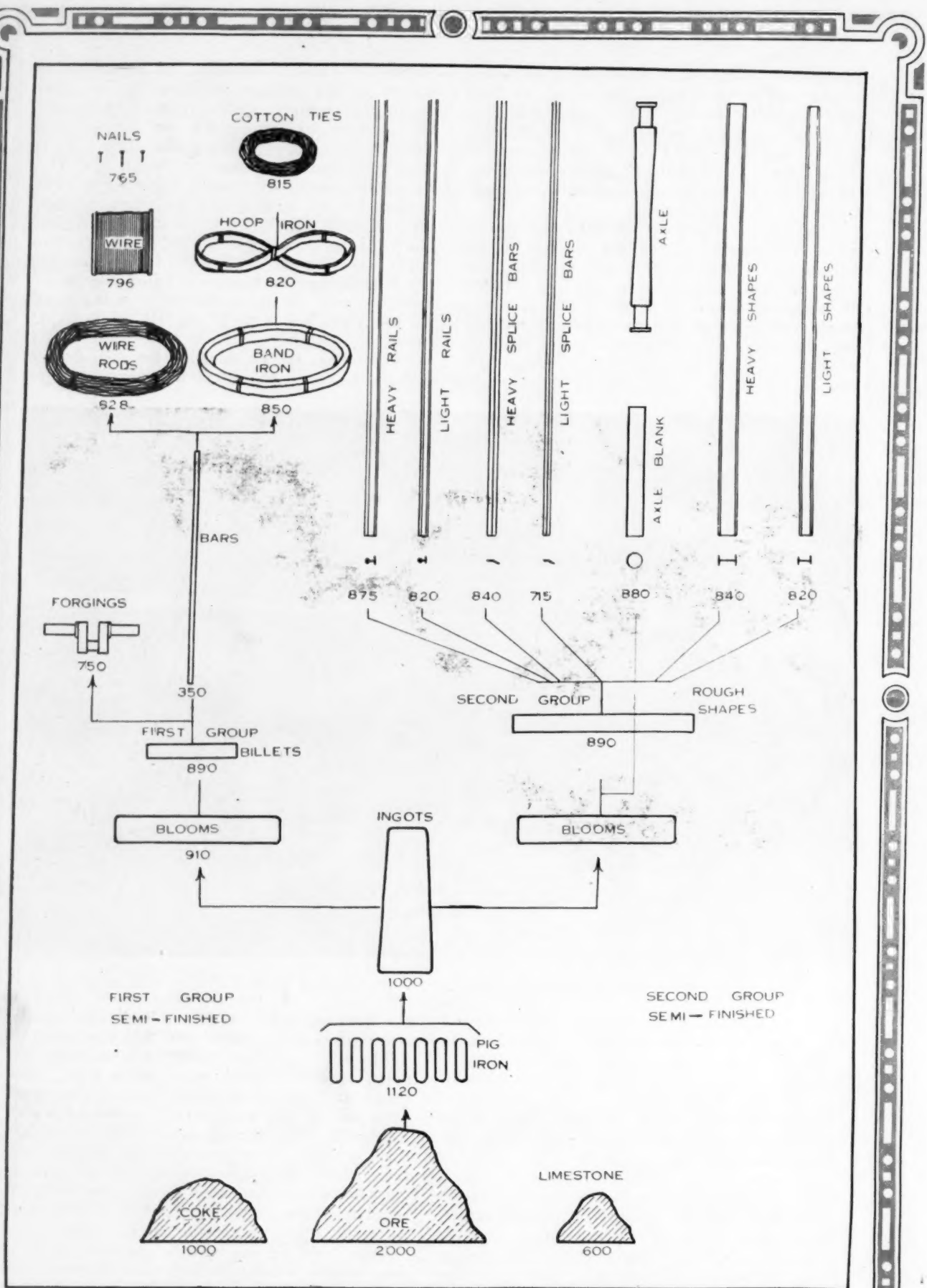


FIG. 20—PRODUCTION CONVERSION CHART. SHOWING THE WEIGHT IN POUNDS OF OPEN-HEARTH STEEL PRODUCTS OBTAINED FROM 2,000 POUNDS OF ORE

caused by drawing, the wire is coated with a lubricant. The drawing may be either by the wet or dry process; the latter is generally used on sizes down to No. 18 and employs tallow or soap-stone as a lubricant, while the former is used for finer wires and a lubricant of rye meal flour and water is used. When a coppered finish is required, a solution of copper sulphate is applied to the wire and then it is given the final drawing. Wire, after being drawn through several dies, becomes hard and must be annealed to render it soft and pliable; it is then pickled, washed and cleaned from scale before being drawn down any further. A large quantity of wire is galvanized, which consists in coating the metal with a thin layer of spelter. Before

from cold-drawn wire in automatic machines, called nail machines. Cut nails are produced from nail plates by an automatic cutting process. Spikes are large nails. Standard railroad spikes are a special design of spike manufactured from hot or cold bar iron or steel wire in automatic machines, called spike machines. Nails and spikes are made in a great many forms and sizes, and are named after the kind of work to which they are applied. They are packed in wooden kegs, each generally weighing 100 to 200 pounds, respectively, and thus shipped. Large quantities also are packed in small cartons and boxes.

Barbed wire consists of two twisted wires to which are securely fastened pointed wires

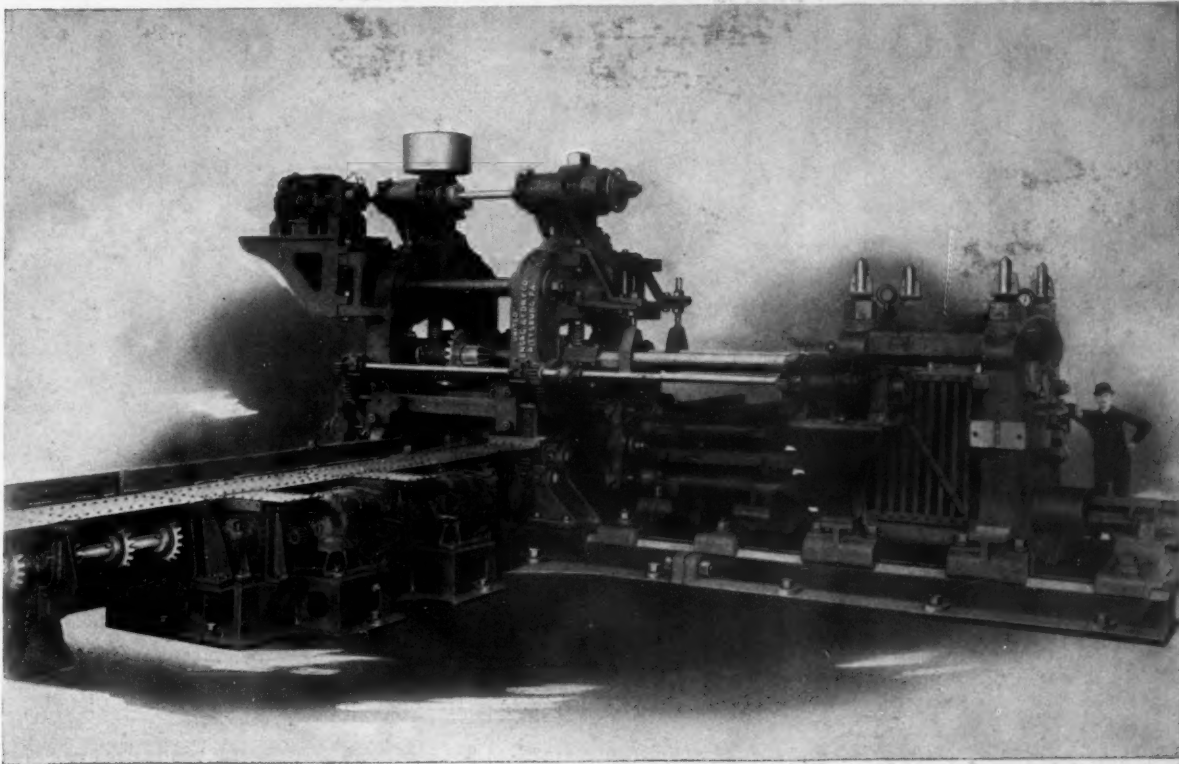


FIG. 21—A 30-INCH UNIVERSAL PLATE MILL

being coated, the wire is annealed and cleaned, passed through a flux bath and then through molten spelter. The excess of spelter is removed by passing through asbestos wipers, or charcoal headers. A large number of wires are thus treated in the same apparatus at the same time.

Nails are short pieces of metal pointed at one end and forged with a head on the other end; they are used for fastening and joining purposes. The shaft of the nail may be of various forms, but is usually round or square. With reference to the method of manufacture, there are two kinds of nails, namely, wire nails and cut nails, wire nails being by far the most important. They are manufactured

called barbs, at intervals of 3 to 6 inches. Barbed wire, generally made from No. 12 to No. 15 gage, is manufactured by automatic machines and is put up on reels from 65 to 85 pounds, called pony reels; and on reels from 100 to 110 pounds, called regular or catch-weight reels. The recent practice is to put 80 rods on a reel, the weights of which vary from 50 to 90 pounds.

Wire rope is composed of a number of wires wound in spirals around a core of lubricated hemp or a wire center. Various kinds of wire rope are manufactured from $\frac{1}{8}$ inch in diameter up to $2\frac{1}{2}$ or 3 inches in diameter, or larger. The use to which the rope is to be put governs the construction, in

other words, the number of wires and strands and the quality of steel or iron which enters into its manufacture. Wire rope is wound on wooden reels or in coils, and is shipped bright, tinned or galvanized.

Telephone or telegraph wire is drawn almost exclusively from iron stock made specially for this purpose. It is galvanized to insure ample protection from corrosion under extreme weather conditions. It is coiled and shipped in bundles of convenient size and weight.

Fence wire is made of steel, any gage, from No. 7 to No. 19. It is black, bright, galvanized or painted. Coiled spring steel fence wire is generally made of Nos. 7 to 14 gage, slightly crimped, in other words, bent

baling hay, straw, shavings, paper, rags, etc., and are shipped in bundles containing 250 ties and made of wire from No. 9 to No. 20 gages.

Wire hoops are used to replace wooden and flat steel hoops, particularly the bilge hoops on slack cooperage barrels and kegs. They are made of wire from 5/16 inch diameter to No. 16 gage, and the ends are joined by electric welding or twisting.

Bolts are short, cylindrical pins with a head on one end and a thread cut on the other end. In conjunction with a nut they serve for uniting parts of materials.

Nuts are square or hexagonal pieces of metal, about the thickness of the bolt, but are provided with a hole; they are tapped

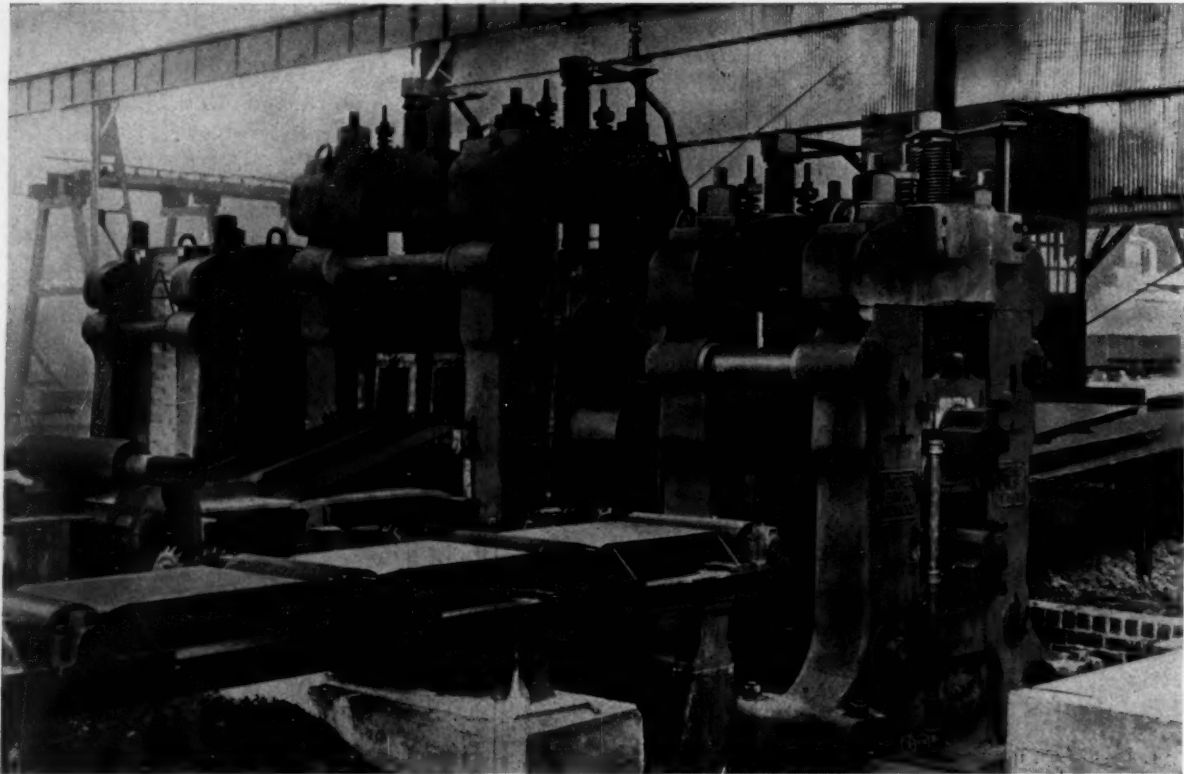


FIG. 22—THE 24-INCH SHEET BAR MILL IN THE PLANT OF THE ANDREWS STEEL CO., NEWPORT, KY.

uniformly at regular intervals from a straight line. It is usually galvanized and shipped in bundles of convenient size and weight.

Woven wire consists of wire fencing, netting, screens, guards, wire cloth, concrete reinforcement fabric, etc. It is manufactured by interlocking, superposing one wire about the other and interweaving them, or by twisting the wires around each other, or by joining the wires at their intersection by means of clips, or electric welding.

The fabrics are produced on a large scale by specially designed automatic machinery and are shipped flat in rolls, or on reels bright, galvanized, tinned or painted.

Bale ties are used almost exclusively for

with a thread to match the thread cut on the bolt to which they belong.

Washers are plain or conical plates provided with a hole to fit the shaft of the bolt to which they belong and are used to provide a better contact between the nut and the material united by a nut and bolt preventing the nut from injuring the material, and increasing the bearing area.

Bolts and nuts are formed in special machines from cold wire for the smaller sizes, and from hot bars or bolt and nut iron for the larger sizes. The thread is cut or rolled on the bolt blank and the punched nut is tapped by special thread-cutting machines.

(To be continued)

SHOW GAIN

Iron and Steel Exports in Past Year
Over 3,000,000 Tons.

Iron and steel exports during the fiscal year ending in June, exceeded 3,000,000 tons, and were 70,000 tons more than the calendar year 1912. Imports of iron and steel during the fiscal year were well over those of the calendar years 1912 and 1911, but were considerably less than in 1910.

The figures for the fiscal year show an export movement of 3,019,143 tons. This total compares with 2,509,798

	IRON AND STEEL EXPORTS, GROSS TONS.			
	June,		Twelve months ending June,	
	1912.	1913.	1912.	1913.
Scrap	13,153	4,995	88,161	102,201
Pig iron	27,152	22,784	185,985	287,022
Billets, sheet bars, etc...	23,800	7,322	234,381	230,728
Wire rods.....	4,996	5,293	47,936	74,823
Rails	48,321	44,574	417,547	453,145
Steel bars....	14,870	16,288	146,045	231,129
Iron bars.....	1,344	814	15,646	22,958
Structural	32,001	37,753	251,535	366,654
Hoop, band & scroll	801	1,167	8,238	18,312
Sheets & plates	47,822	41,529	465,317	542,914
Tin plates....	9,228	5,576	81,205	73,376
Barbed wire..	7,925	6,108	103,101	87,528
All oth. wire.	12,103	11,875	140,977	137,795
Cut nails.....	2,246	175	12,353	4,805
Wire nails....	5,044	3,824	62,916	54,526
All oth., includ- ing tacks...	1,036	229	12,572	4,209
Pipes & fittings	20,928	28,194	231,670	282,230
Railroad spikes	•	1,644	•	13,382
Bolts, nuts, riv- ets, washers.	•	2,177	•	21,633
Horseshoes ..	•	88	•	1,158
Cast radiators.	418	780	4,213	8,615
Total	273,188	243,189	2,509,798	3,019,143

*Not stated prior to July 1, 1912.

tons during the fiscal year ended June, 1912, a gain the past year of half a million tons.

The principal gains made in the ex-

	IMPORTS BY MONTHS.			
	1910.	1911.	1912.	1913.
January	56,207	33,071	20,008	21,741
February	43,613	20,812	11,622	24,904
March	54,176	23,533	15,466	27,247
April	47,698	22,392	12,481	25,743
May	42,569	23,347	15,949	28,572
June	30,322	29,399	21,407	36,597
July	41,933	15,782	17,916	.....
August	36,879	10,944	20,572	.....
September	30,961	14,039	18,740	.....
October	31,455	21,035	25,559	.....
November	40,585	13,880	24,154	.....
December	31,575	19,665	21,231	.....
Totals	487,973	256,903	225,072	164,804

port movement were: Pig iron, 100,000 tons; rails, 35,000 tons; steel bars, 85,000 tons; structural material, 115,

000 tons; sheets and plates, 75,000 tons; pipes and fittings, 50,000 tons; wire rods, 35,000 tons. Small decreases were shown in billets and sheet bars, tin plates, barbed wire, all other wire and wire nails.

In imports, pig iron gained 40,000 tons; scrap, 27,000; bar iron, 7,000; structural material, 6,000; tin plates, 10,000.

The value of exports for the past fiscal year was \$304,605,797, com-

pared with \$259,709,399 for the preceding fiscal year and \$222,700,724 for the year ending June, 1911. The values of imports for the corresponding fiscal years were \$33,636,358, \$26,551,040 and \$34,205,968.

IRON AND STEEL IMPORTS, GROSS TONS.

	June,		Twelve months ending June,	
	1912.	1913.	1912.	1913.
Scrap	1,170	5,669	14,238	41,163
Pig iron	14,354	13,506	115,321	155,169
Blooms, billets, steel, n. e. s.	1,423	2,110	22,485	20,869
Wire rods.....	1,042	2,237	13,927	17,143
Rails	308	597	3,297	5,024
Bar iron.....	2,682	2,840	23,672	30,168
Structural	62	1,745	2,863	8,005
Sheet & plates..	208	167	2,522	3,724
Tin plates.....	158	7,726	2,952	12,654
Totals	21,407	36,597	201,277	293,919

pared with \$259,709,399 for the preceding fiscal year and \$222,700,724 for the year ending June, 1911. The values of imports for the corresponding fiscal years were \$33,636,358, \$26,551,040 and \$34,205,968.

June exports showed a falling off in value from May, the figures being \$25,228,346 against \$26,718,970. For the six months ended in June, the total value of exports is \$155,498,837, or slightly above the record-breaking rate of the past fiscal year.

Exports of tonnage lines aggregated 243,189 tons in June, a small gain over

IRON ORE IMPORTS, BY MONTHS.

	1910.	1911.	1912.	1913.
January ..	284,823	102,600	154,118	175,463
February..	170,427	94,820	129,693	188,734
March ...	163,633	134,785	157,469	164,865
April	206,135	133,900	178,502	174,162
May	240,833	217,467	194,482	191,860
June	193,415	118,296	180,112	241,069
July	248,810	200,845	185,677	.....
August ...	282,949	175,183	178,828	.....
September.	208,892	184,456	180,571	.....
October ..	219,571	172,459	202,125	.....
November	197,833	128,019	163,017	.....
December..	173,710	148,902	199,982	.....
Totals	2,591,031	1,811,732	2,104,576	1,136,153

May, but less than during April and March. The exports for the first six months were 1,494,280 tons, a rate about 50,000 tons above the figure reached in the calendar year 1912.

Imports in June of tonnage lines

were 36,597 tons, the highest figure since November, 1910. The principal gain was made in tin plates, while pig iron imports were heavier. Iron ore imports also showed a heavy gain in June, with 241,069 tons, the highest figure reached since August, 1910, and 50,000 tons above the imports in May.

MORE TIN PLATE

Purchased by Standard Oil Co. from
Welsh Makers

The Standard Oil Co. has just placed with Welsh makers an additional order for 10,000 boxes of tin plate for delivery to one of its plants in the Philadelphia district. This plate will be devoted to re-export purposes. With the 99 per cent drawback of the duty allowable on re-export material, it is reported the tin plate will cost the buyer less than \$3 per 100-pound box delivered at its works. Domestic makers quoting officially \$3.60 Pittsburgh have not been able to compete against the Welsh mills upon this business.

Reopening Magnetic Mines

Negotiations for the reopening of magnetic iron mines at Boyertown, Pa., are underway. These mines were extensively operated by the Phoenix Iron Co., the Warwick Iron Co., and by Gable, Jones & Gable for many years, but were closed on account of litigation growing out of conflicting claims to the ore bodies. All of the interests in the deposit have now been combined and additional territory secured, and the syndicate, represented by W. S. Harvey, 100 Broadway, New York City, is proposing to start operations on an extensive scale. The magnetic ore carries a high sulphur-content and it is proposed to beneficiate the ore for the purpose of increasing its iron and eliminating the sulphur. Engineers' reports give an estimate of developed ore in excess of 2,500,000 tons above the 600-foot level. The deposit has been extensively opened up and is believed to carry a large tonnage in depth.

VALUE OF IRON AND STEEL EXPORTS—TONNAGE AND NON-TONNAGE.

	1909.	1910.	1911.	1912.	1913.
January	\$10,329,388	\$14,513,394	\$18,738,391	\$18,451,914	\$25,141,409
February ..	10,947,159	13,949,082	18,690,792	21,801,570	24,085,871
March	13,873,746	17,253,503	22,591,991	24,474,799	27,201,197
April	13,058,297	16,529,260	24,916,912	26,789,853	27,123,044
May	12,964,367	17,658,042	20,616,795	27,332,701	26,718,970
June	13,779,736	16,503,204	20,310,053	24,117,515	25,228,346
July	11,866,772	16,108,102	17,454,772	24,913,052	.....
August	14,134,487	17,628,537	20,013,557	25,450,107	.....
September	12,966,908	16,776,178	19,875,308	23,286,040	.....
October ..	14,249,598	17,452,085	20,220,833	25,273,059	.....
November ..	14,434,690	18,594,806	20,823,061	26,406,425	.....
December ..	15,059,246	18,300,710	22,186,996	23,750,864	.....
Totals	\$157,674,394	\$201,271,903	\$249,656,411	\$289,128,420	\$155,498,837

EXPORTS OF TONNAGE LINES—GROSS TONS.

	1909.	1910.	1911.	1912.	1913.
January ...	70,109	118,681	152,362	151,575	249,532
February ...	84,837	110,224	150,919	204,969	241,874
March	94,519	124,980	216,360	218,219	257,053
April	100,911	117,921	228,149	267,313	260,440
May	109,808	135,306	178,589	307,758	242,192
June	114,724	120,601	174,247	273,188	243,189
July	100,850	127,578	162,855	272,944	.....
August ...	105,690	131,391	177,902	282,835	.....
September	97,641	119,155	181,150	248,746	.....
October ..	110,821	129,828	186,457	250,611	.....
November	116,105	155,138	187,554	233,341	.....
December	137,806	150,102	190,854	235,931	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	1,494,280

THE IRON TRADE REVIEW

DEVOTED TO THE IRON, STEEL, MACHINERY
AND FOUNDRY INDUSTRIES

Published Every Thursday by

The Penton Publishing Company

CLEVELAND

BOSTON	201 Devonshire Street
CHICAGO	1521-23 Lytton Bldg.
CINCINNATI	573 Mercantile Library Bldg.
NEW YORK	503-04 West St. Bldg.
PHILADELPHIA	611 Bulletin Bldg.
PITTSBURGH	2148-43 Oliver Bldg.
WASHINGTON, D. C.	501 Metropolitan Bank Bldg.
BIRMINGHAM, ENG.	Princes Chambers

Copies published three months or more previous to date of
current issue, 25 cents each.

All communications relating to changes of advertising copy, discontinuances,
etc., must be received ten days prior to the next publishing date.

Subscription, United States and Mexico \$1 per year.
Canada \$6 and other Foreign Countries \$3 a year.

Entered at the Postoffice at Cleveland as Second Class Matter.

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Cleveland, August 21, 1913

Adjusting the Balance

The merchant pig iron industry in eastern Pennsylvania apparently is now in another of its not infrequent curtailment moods. Recent reports have given the information that four additional merchant stacks in that district have gone out within the past week or 10 days or will do so within a short period. Other reductions of active capacity are promised if the pig iron market does not speedily advance in price in a much more marked manner than it has recently done.

Merchant iron output in eastern Pennsylvania is now at the lowest point of the year. Eight months ago, it was reliably estimated that about 70 per cent of the full rated capacity of the district was in blast. This activity represented practically full operations, inasmuch as the market at that time was \$2.50 to \$3 a ton above the present level, and there was a demand for practically all output except that from the extremely high cost and least modern stacks. Now the active merchant furnaces, numerically speaking, in the Lehigh, Schuylkill and Lebanon valleys have been cut since Jan. 1 last more than 50 per cent. How severe this reduction has been is shown by the fact that two companies with six or seven operative furnaces each are now running but two furnaces each and promise further curtailment.

Considerable of the cut of output in eastern Pennsylvania was the logical concomitant of the drop of \$2.50 to \$3 in the iron market which again forced into idleness many of the smaller and higher cost furnaces that invariably are tempted back into activity

by each pronounced upward movement of the market. Another and more important factor in this decline of production is the present level of furnace raw materials. While pig iron has dropped and seemed never to strike bottom, coke and iron ore on the average have remained practically constant on the plane where the last advance in the iron market had carried them. Present quotations of \$4 to \$4.50, delivered, for furnace coke and around \$8, delivered, per 100 units of iron are figures whose significance to the eastern Pennsylvania iron maker cannot be mistaken. Eastern Pennsylvania today is able to offer little, if any, normal support to present coke and ore prices, and manifests this by its present temper. Except for the more fortunately situated furnaces possessing nearby ore or coke supplies, there is little inducement for these makers to run freely and they are unable to offer lower prices to iron consumers which might increase their orders.

The present experience of the eastern makers renders pertinent the question whether raw material prices are not out of balance with the iron market. What is true of eastern Pennsylvania in a marked way undoubtedly applies with less force to other producing districts. With the furnace curtailment now being forced by a combination of low iron market and what appears to be relatively excessive raw material costs, it is difficult to see how coke and ore can escape assuming their just proportion of the necessary readjustment.

Basing Prices on Chicago

A few years ago, all steel products sold in the west were quoted f. o. b. Pittsburgh plus freight to point of delivery. The growth of steel making capacity in Illinois and Indiana, particularly in the Chicago district, is gradually changing this custom. At present, the steel mills surrounding Chicago have an annual capacity of nearly 5,500,000 tons of finished products, or about 14 per cent of the total capacity of the country. The western makers, especially the independents, feel that this volume of business justifies them in establishing their own basing points, and although it has not yet been found expedient to break away entirely from the influence of the Pittsburgh market, the tendency to quote f. o. b. Chicago is growing.

This tendency is naturally more pronounced in a soft market than in a period of great activity, for a change in basing point permits the manufacturer to reduce prices with the least disturbance to market conditions and the buyer is usually complimented by being granted what are termed special concessions. In the period of low prices following the break in May, 1911, the Pittsburgh basing price was abandoned by practically all makers in the west on all products except wire. In November, 1911, when plates and shapes were 1.15c, Pittsburgh, equivalent to 1.33c, Chicago,

the local mills were quoting 1.25c and 1.30c, Chicago. In the good business enjoyed in 1912, these differentials were allowed to lapse and all prices restored to the Pittsburgh base.

In the present uncertainty, quotations based on Chicago instead of Pittsburgh are again appearing in the west. For instance, structural rivets are now quoted 2.03c, Chicago, and 2c, Pittsburgh. Local sheet makers have also been quoting f. o. b. mill.

It is not likely that the Chicago market will become totally independent of the east in the near future, but each reaction hastens the day. Chicago's importance as a steel making center is rapidly growing and every new plant is an added argument for the permanent establishment of a local market.

Corn and Steel

The continued hot spell in Kansas, Oklahoma and neighboring states, which it is practically conceded will cause a further loss of 150,000,000 bushels in the corn crop, will not have a reassuring influence on a somewhat nervous steel market. The agricultural demand for steel products, particularly wire, sheets, bars, etc., is growing relatively more important and the manufacturers are sure to feel, both directly and indirectly, the effects of any considerable agricultural calamity.

But there is no cause for widespread alarm over the situation as it exists at present. Even if conditions are as bad as reported, which may be doubted, the area affected is relatively small and in general, agricultural conditions are above the 10-year average. In the northwest, from Wisconsin to Washington, the crop of wheat, fruits and other products will again break records and will probably equal the bumper yield of last year. In the south, the outlook is good, and the same may be said of Canada.

Corn damage will undoubtedly have its effect on the market, but there is no reason why any manufacturer of iron and steel products should feel at all uneasy over general agricultural conditions.

Living Conditions on the Copper Ranges

In a statement issued by union officials, the cause of the disastrous strike now in progress in the copper country is laid to a "deep-seated unrest", due, it is alleged, to unfavorable labor conditions existing on the upper Michigan peninsula compared with other copper mining centers. The statement of the unions goes into particulars and draws invidious comparisons between wages, hours of labor, etc., in Butte or Arizona and Calumet.

This is simply playing on the ignorance of the public with regard to living conditions in the various copper camps in the United States. It is true that wages in the Michigan copper mines are somewhat less than they are in the west, but general conditions are so much better in Michigan that the net advan-

tage is decidedly with the Calumet district. In the first place, the cost of living in Butte or Arizona is at least 25 per cent higher than it is on the upper peninsula. Also, a man who had only the choice between Calumet or Butte, for instance, would not hesitate to choose the former. The Arizona mines are in a desert region, thriving with sage brush and intolerable heat. The mines on the copper range, on the other hand, are set in a natural wooded, well-watered, rolling country on the shores of Lake Superior. It is a country which is rapidly becoming as famous for its summer resorts as for its mining activities. The union agitators in the copper strike should base their claims on something more substantial than a difference in wages and living conditions which an unbiased analysis would show is decidedly in favor of the copper country.

Steel Making on the Pacific Coast

Periodically reports arise that a large steel industry is to be established on the Pacific coast. Usually they originate from the office of some skillful promoter who has much better facilities for the production of stock certificates than he has for working iron ore into finished products. Prospective investors in such enterprises would do well to read the comments of J. A. McGregor, president of the Union Iron Works, San Francisco, recently published in THE IRON TRADE REVIEW. Mr. McGregor does not state that steel making is an impossibility on the Pacific coast, but he points out some of the essential difficulties very clearly.

He fails, however, to mention one of the chief stumbling blocks, namely the relatively small quantities of the various iron and steel products consumed west of the Rocky Mountains. The booklets of the promoters usually start out with the encouraging statement that the consumption of steel on the Pacific coast exceeds 1,000,000 tons a year. They neglect, however, to state that this tonnage is divided among innumerable different articles and that there is not enough demand for any one commodity at present to justify the erection of a mill. The financial success of modern steel-making is based upon the ability of the mill superintendent to roll a heavy tonnage of a single product of a certain size at one time and any plant which had to be hourly changing rolls and changing orders could not make a success. The promoters on the Pacific coast also usually fail to state that over 30 per cent of the consumption is steel rails, for the production of which there is already sufficient capacity in the east for even the most active season. Furthermore, the western railroads have adjusted their freight rates to favor the importation of manufactured articles from the eastern states, and before any large, permanent manufacturing industry can be developed in the west, these tariffs must be radically readjusted.

There is no doubt that all of these obstacles will be overcome in time, but years of study and effort and an abundance of capital will be required. The problem is decidedly not one for the small investor or the inexperienced.

Course of Iron Output and Prices in Century

Unusual Research Covering the Period, 1800-1910, Brings Out Interesting Conclusions Relative to Future of Industry

By E C Eckel¹

In the course of an entirely different study, data relative to the past growth of the American iron industry for the period since 1800 were put into shape for comparison with the course of prices during the same period. So far as I know, no previous publication has covered this particular field, and as the data may be of general interest, they have been put in shape for publication in *THE IRON TRADE REVIEW*.

In addition to the actual facts pre-

existence of price agreements had better be sought elsewhere than by attempting to draw conclusions from price-charts. Statistical methods of research are undoubtedly of high value, but they require a very intimate acquaintance with the details of the industry under review before the results can be considered reliable; and even then the methods themselves are subject to certain necessary and inherent limitations. Some of these limitations are suggested in the course

sary work, and that they are offered here rather as suggestions toward further study than as finished products.

In the following table the iron output, the coal output and the population of the United States have been stated for each tenth year from 1850 to 1910, inclusive. The percentage of growth of each of these elements has also been calculated for each decade.

The first fact brought out by this table is that, up to the present time, the use of iron has advanced so much more rapidly than the population that there is no particular interest in figuring out data on the *per capita* output of iron. We might in this regard simply note that in 1850 the American output of pig iron amounted to about 54 pounds per capita, while by 1910 it had risen to 665 pounds per capita.

A more interesting matter, however, is the steadiness with which coal and pig iron have maintained their respective positions. In 1860, for example, 17.8 tons of coal were mined per ton of pig iron produced; in 1910 the ratio was 18.3 tons of coal to each ton of pig metal.

The principal value of the table, arranged by decades as it is, lies in its warning against drawing hasty conclusions as to the possibilities of future growth in either of the industries which it summarizes. The future rate of growth of the coal and iron industries has been discussed by scores of eminent mathematicians and geologists, in both England and the United States. In each case that has come to my attention the investigator makes either explicitly or implicitly, the assumption that the figures representing such growth must follow some definite rule or curve, and that the whole problem consists in selecting the formula which will fit this curve most exactly. There is, it must be admitted, an element of truth in this generally accepted assumption. For, if we could assume that *no new factors will in future be introduced into our industrial development*, it is then possible to say that any industry depending on a limited supply of natural raw materials will, either immediately or in future, show a regular decrease in *rate* of annual growth; and that this decrease in rate will continue until the *actual* annual increases in output are small. To this extent, then, a purely mathematical

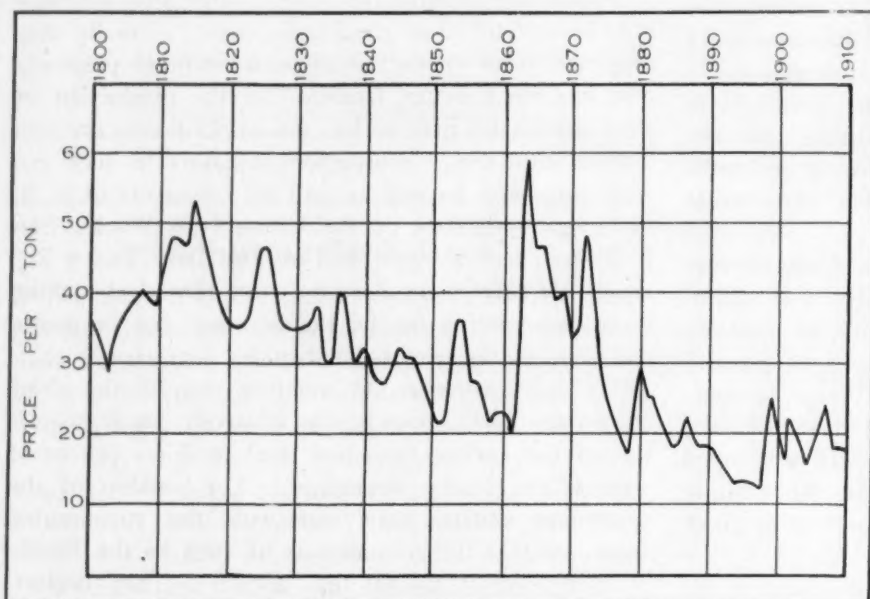


FIG. 1—PRICES OF STANDARD PIG IRON, PHILADELPHIA, 1800-1910

sented in the accompanying tables and diagrams, they bring out rather strongly certain points which are often overlooked, bearing on the methods and value of purely statistical researches. It has of late become a somewhat common practice to draw a curve through a series of production figures at various dates, and to assume hastily that this curve may safely be prolonged into the future, so as to become prophetic. It has also become a familiar practice to plot the course of prices in a diagram, and to attempt to draw definite conclusions as to the reasons for the prices. It seems to me that careful study of the material presented in this paper will suggest that prophecy as to future production is still a somewhat hazardous business; and that evidence as to the

of the present paper, and doubtless others will suggest themselves to the reader at various points in the discussion. Statistics of themselves are practically worthless; they are of high value when properly interpreted; but there are natural limits to their use, and there is always danger of ignorant or intentional mis-interpretation.

Character of Work

Some apology might also be made for the brevity and obvious incompleteness of the discussion. These must contrast unfavorably with the detailed and exhaustive treatment of such subjects to which recent official investigations have accustomed the iron industry. In explanation it can only be urged that the results presented were gathered incidentally, in the course of more neces-

¹725 Munsey building, Washington, D. C.

treatment of the subject is justified, though even then the exact type of curve to be adopted would be open to discussion.

As soon, however, as we consider the matter historically, we will see that the basal assumption of the curve-tracers is not only doubtful, but absolutely invalid. We find, however steady the progress of any industry may appear to be when only a few years or decades are considered, that at irregular intervals new factors are injected into the situation; that these factors are of a type whose coming cannot be predicted, and whose influence cannot be determined and allowed for in advance. And the more complete our knowledge is of the history of any industry, the less likely we are to adopt any precise and limited views as to its possible future trend.

Good examples of the unexpected appearance of new factors are afforded by the two occurrences which have most powerfully influenced the iron industry during the past 150 years. Of these the most important was the series of inventions and industrial changes which, during the last half of the 18th century, effected the "Industrial Revolution" in England and later in Europe. The second, almost a century later, occurred when steel became a really commercial metal, susceptible of production in large tonnages and at a reasonable cost. Each of these great changes exerted a powerful influence over the output of iron during the immediately succeeding years.

The Trend of Iron Prices

In making any study of the average trend of iron prices in the United States during the past century, certain tables published by J. M. Swank in his *Iron in All Ages*, and supplemented in his later annual reports, will furnish the best general data. Fig. 1 shows, in diagrammatic form, the result of combining these data for the period 1800 to 1910, inclusive. The prices per ton which have been used are from 1800 to 1849, the average annual price of charcoal pig iron at Philadelphia; for the years since 1849, the prices are those of anthracite pig at the same point.

On examining this diagram, certain points will be immediately noted. Perhaps the first thing which catches the eye will be the remarkable fluctuations in price from year to year, concerning which it may be added that, contrary to a popular impression, these fluctuations appear to have been just as severe in the days before the war as they have been in recent years. The second point which will strike the reader's eye will be the way in which the war, with its increased demand and its doubtful currency, shifted prices bodily upward for a decade or so. Not until specie re-

sumption and the panic of 1873 could prices be considered to have come back to a normal level.

The most important thing shown by the diagram is, however, likely to be overlooked owing to the temporary fluctuations. This is the fact that, beginning with pig iron at an average price of about \$40 per ton in 1810 and thereabouts, the trend of prices has been, in the long run, unmistakably downward. If we could omit the civil war decade, it would be seen that the fall from \$40 in 1810 to \$12 in 1898 was regular and definite in trend, though

factors last named combined to put iron prices down to points which they are not likely to reach again. New ores were being poured upon the market, ending with the opening of the wonderful Mesabi range in 1892; the country was experimenting with low tariffs, while far more dangerous currency innovations were threatened; and iron-making capacity seemed for the time to have overrun the effective demand. Out of this series of factors came prices for pig iron and other iron products which were not only lower than had been seen up to that time, but were lower than are

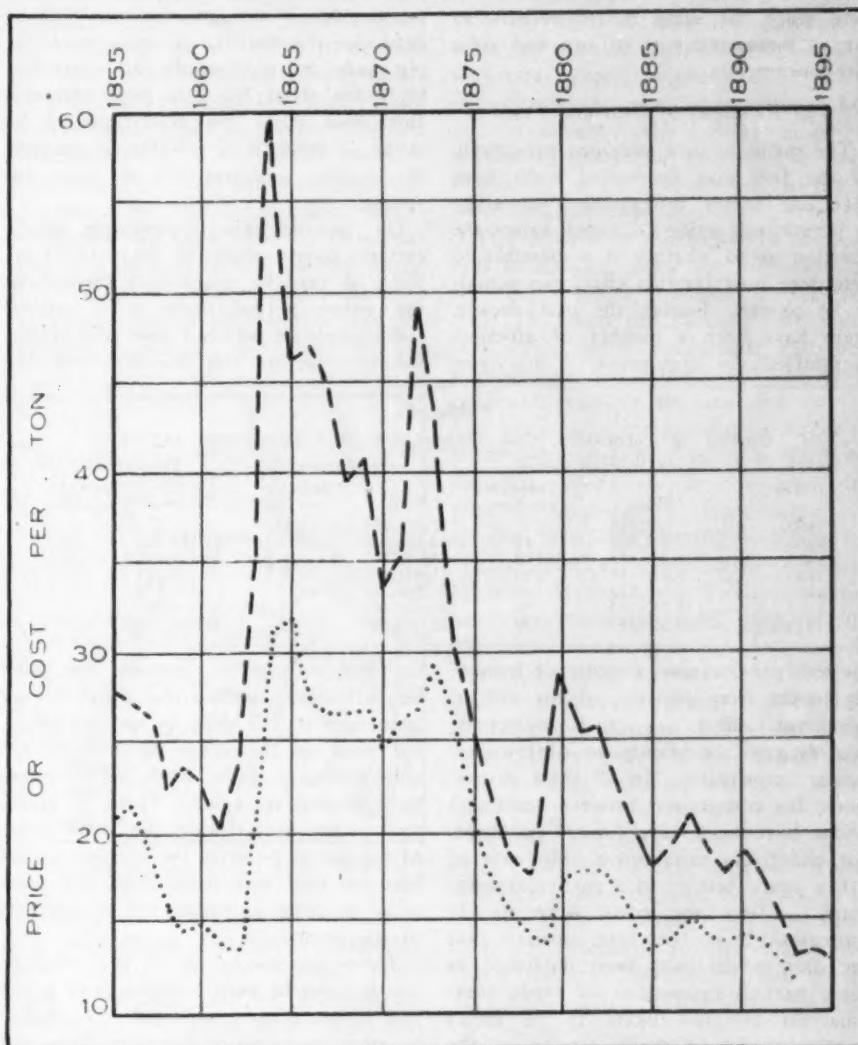


FIG. 2—PIG IRON COSTS AND PRICES, 1855-1895
 --- PRICES OF ANTHRACITE IRON, NO. 1, PHILADELPHIA
 COST OF MAKING ANTHRACITE IRON, LEHIGH DISTRICT

at any given moment the observer might have been misled by temporary fluctuations into some other conclusion. This general decline was due to the increased severity of competition, to the opening of new sources of ore and fuel supply, and to improvements in processes of manufacture.

The period between 1880 and 1898, which witnessed a practically uninterrupted fall in the price of iron from \$29 to \$12, was one in which all of the

likely to be seen again. Until a new ore range like the Mesabi is unexpectedly opened, or entirely new methods of iron making are perfected, it is improbable that average costs of iron making can be so reduced as to enable manufacturers to quote prices such as those made in 1898.

So far as can be told now, 1898 marked a general and important turning point in the matter of iron prices. There will be severe fluctuations in the future,

undoubtedly, just as there have been in the past, but the general trend of prices is likely to be slowly upward rather than downward. The increasing cost and lowering grade of our average ores and fuels, and the increasing cost of labor, will serve to increase costs of iron making, slowly but steadily. And this increase in average cost of making pig iron will, in turn, operate to increase its average selling price, for there is no serious reason to believe that the chief competitive foreign iron districts have different conditions to face. Both the Cleveland district of England and the Luxemburg-Lorraine region have, in fact, much the same future outlook so far as increasing cost of ore and coke are concerned.

The Relations of Cost and Price

The mention, in a previous paragraph, of the fact that decreasing costs have been one factor in causing (or rather in permitting) price decreases, raises the question as to whether it is possible to determine how far this effect can actually be proven. During the past decade, there have been a number of attempts to establish, by arguments of this type,

after 1873, and the final decline toward the low prices which culminated in 1893. The figures are valuable and interesting of themselves, but they become more so when placed in such form that they can be readily compared with the general trend of prices during the same period. This has accordingly been done in Fig. 2, where the matter is placed on a diagrammatic basis. In this diagram, the lower dotted line represents the average annual costs of iron-making at the Thomas plant from 1855 to 1892; while the upper broken line represents the average annual price of No. 1 anthracite pig at Philadelphia. It is, of course, not practicable to compare the two sets of data directly, for the average grade of pig made and sold would fall considerably below strict No. 1 in price obtained. But even with this restriction to be borne in mind, it is possible to examine the results comparatively to some advantage.

On making this comparative study, certain points seem to be established. First, it may be noted that throughout the entire period there is a general correspondence between costs and prices; the two factors rise together and fall

RAPID INCREASE

In Exports From the United States to Canada.

Washington, Aug. 18.—Figures have been compiled by the Bureau of Foreign and Domestic Commerce, Department of Commerce, showing that exports in the last three years from the United States to Canada have practically doubled. Only the United Kingdom now outranks Canada as a purchaser of United States products, it having bought goods to the value of \$415,000,000 in the fiscal year 1913. Manufactures form about two-thirds of the exportations. The gain in the three years, 1910 to 1913, is denoted by the following figures:

Passenger and freight cars, from \$500,000 to \$5,333,000; automobiles, \$3,333,000 to \$9,250,000; copper in pigs, bars, etc., from less than \$1,000,000 to over \$6,500,000; steel rails, from less than \$1,000,000 to nearly \$4,000,000; locomotives, from \$250,000 to over \$1,000,000; structural iron and steel, from less than \$3,000,000 to over \$9,000,000; metal-working machinery, from \$333,000 to \$2,333,000; agricultural implements, \$3,333,000 to practically \$7,000,000; pipes and fittings, \$1,500,000 to over \$4,000,000.

Imports from Canada in 1910 totaled \$95,000,000, as against \$121,000,000 in 1913. Among the chief articles imported were copper in pigs, bars, etc., which increased from \$3,750,000 to \$5,750,000, and copper in ore, from less than \$1,000,000 to over \$3,000,000.

Table I.

GROWTH OF POPULATION, COAL OUTPUT AND IRON PRODUCTION, 1850-1910.

Year.	Pig-iron output,		Coal output,		Population,	
	Tons.	Increase, per cent.	Tons.	Increase, per cent.	Persons.	Increase, per cent.
1850.....	563,755	...	7,018,181	...	23,191,876	..
1860.....	821,223	45	14,610,042	109	31,443,321	36
1870.....	1,665,179	100	33,035,580	126	38,558,271	23
1880.....	3,835,191	130	71,481,570	117	50,155,783	30
1890.....	9,202,703	140	157,770,963	121	62,947,714	26
1900.....	13,789,242	50	269,684,027	71	75,994,575	21
1910.....	27,303,567	98	501,596,378	86	91,972,266	21

the existence or non-existence of monopoly in the iron industry, or the evil or beneficent effects of such monopoly, according to the standpoint of the particular investigator. In all these discussions, the comparison between costs and prices have been very limited in scope, for either the comparison only covered a few years' history of a particular company, or else the costs were merely estimates. It is, therefore, obvious that the data which have been published in these various discussions of trade combinations are not likely to be broad enough to be of much service in the present discussion. Fortunately, however, there happens to be on record a very valuable summary covering just the points in question.

In the first annual volume of *The Mineral Industry*, W. B. Phillips was enabled, through the courtesy of the Thomas Iron Co., to present detailed statements of cost at its plants annually from the beginning of operations in 1855 to the date of publication, in 1892. This covers a very interesting portion of the history of American iron making, including a few years before the war, the period of the war and later disturbed currency conditions, and readjustment

together in general. Second, this must be qualified by adding that costs do not commence to fall quite as soon as prices, but that on the other hand costs are still falling a little while after prices have started up again. Third, it seems fair to say that during the latter years of the period covered, the average spread between cost and price does not seem to be as large as during the earlier part of the record.

These statements as to the relations which seem to exist between iron prices and iron-making costs might be applied to other questions now under discussion, as for example the determination of monopoly or pool prices. It is clear enough that a practically level price line may arise from other causes than the existence of monopoly, of pools or of any other form of price regulation. During each period of business slackness or depression, for example, we reach a time when prices hold a definite level for a long period, not because there is agreement to hold a certain price, but because a point has been reached where there is no profit in breaking below this level. A similar thing takes place at the top of a boom, when prices hold steadily, though buyers will not come in.

Launch British Steel Company

A new company to be known as the Simpson & Oviatt British Iron & Steel Corporation and capitalized at \$10,000,000 has been organized in London according to dispatches just received. The new company has been registered and is said to be backed by a syndicate of well-known capitalists. The first signatories are Biggart, Lumsden & Co., of Glasgow, members of the Shipbuilders Employers' Federation. The company announces that it will carry on the manufacture of iron and steel in addition to shipbuilding, mining and the building of railroads.

Comley B. Shoemaker, president of the Glasgow Iron Co., Pottstown, Pa., lies in a Philadelphia hospital suffering from a broken hip, which he sustained a few days ago as a result of a fall at Philadelphia. Owing to Mr. Shoemaker's advanced age the accident is regarded as serious.

Railroads Unexpectedly Change Ore Rates

Reductions Voluntarily Made to Important Points May Hasten Adjustment to Others—Another Blow at the Equalization Theory

Washington, Aug. 19.—Readjustment of the entire ore rate structure in the great consuming districts of Pennsylvania, Ohio, and West Virginia, now in a chaotic condition, promises to be expedited as a result of a series of developments the past week.

Summarized, they are as follows:

The Interstate Commerce Commission declined to suspend the new direct ore rate of 88 cents from Lake Erie ports to the Wheeling district, effective Aug. 15, the request having been made by the Wheeling Steel & Iron Co., Wheeling, in an informal petition.

The Wheeling company, in its own behalf and for other consumers in that district, filed with the commission a formal complaint, elaborating upon points made in its previous petition. It is set forth that the 88 cent rate, an advance of 28 cents per ton, creates a discrimination against the Wheeling district in favor of the Columbus, Zanesville, Ashland-Ironton and Jackson districts.

The Pittsburgh Steel Co., Pittsburgh, also filed a formal complaint against the 88 cent rate, charging that the discrimination against the Pittsburgh district which existed in the past has not been eliminated by the new rate, a reduction of only 8 cents per ton. This complainant, like the Wheeling company, claims the Columbus, Zanesville, Ashland-Ironton and Jackson districts are given an undue advantage, their rates having remained unchanged.

The Wheeling & Lake Erie filed a tariff, effective Sept. 15, establishing an ore rate of 70 cents to Steubenville and Mingo, O., but leaving other points in the Wheeling district, and McKeesport and Clairton, in the Pittsburgh district at 88 cents.

The Pennsylvania Co. has not met the 70 cent rate to Steubenville and Mingo. To do so would probably mean the same rate would have to be applied by it throughout the Wheeling and Pittsburgh districts.

Several significant reasons may be attached to the action of the Wheeling & Lake Erie in placing these two points on a 70 cent basis. It may mean, for instance, that that rate is confidently expected to be the one to be finally adopted throughout both districts. It may even extend further

and embrace the Beaver district of Pennsylvania, with a new rate of 70 cents, and the Columbus, Zanesville and Jackson districts, whose rates are now 50 cents, 55 cents and 62½ cents, respectively. At least, it is held by those opposing the new 88 cent rate, that it will never stand, and that with a readjustment ordered by the commission, its scope will have to include not only the two districts to which the 88 cent rate applies, but other Pennsylvania, Ohio and West Virginia districts.

It also has not become apparent why the Wheeling & Lake Erie established the 70 cent rate to Steubenville and Mingo, while at the same time the other Wheeling and the two Pittsburgh district points were left unchanged. Mingo and Steubenville



PROPOSED "BEAVER DISTRICT"

combined have a possible consumption of 1,500,000 tons of ore annually, the capacity of the former place being 1,000,000, and of Steubenville 500,000. It is seen from this that these are very important rating points and it is evident that after Sept. 15 the Wheeling & Lake Erie will get practically all, if not all, the tonnage carried to them, unless the proposed rate is disturbed or in some manner met.

One reason given for the refusal of the commission to suspend the 88 cent rate to Wheeling is that the commission did not have time to give due consideration to the point. Some of the commissioners are out of the city and were communicated with by wire or mail.

It is not believed that the hearing,

which will follow as a result of the commission's declination to suspend the rate, will be held jointly with the Pittsburgh Steel Co. case, although the points at issue are largely identical and both complainants are represented by the same counsel, Ellison & Donaldson, Washington.

It is expected that the cases will come up for an early hearing, and a vigorous contest is predicted. In the Wheeling case, the rate involved being an advance, the burden of proof is placed upon the railroads, a task which, it is contended, will prove a most difficult one.

The Wheeling company, in its formal complaint, says the old rate of 60 cents, which became inoperative Aug. 15, when the 88 cent rate went into effect, is a reasonable rate for the service performed; that it is a profitable rate to the carriers and in line with rates maintained by them to other ore-consuming districts similarly situated. Moreover, it is pointed out that the expense of transporting ore to the Wheeling district has not increased, but, on the contrary, is constantly decreasing. The Wheeling company consumes approximately 350,000 tons of ore annually, and says it has adjusted its business on a 60 cent basis. Notice is given the carriers that the complainant will claim reparation, if compelled to pay the 88 cent rate, pending the final decision in this case.

In the Pittsburgh Steel Co. complaint, distances to the Pittsburgh district are compared with those to competing points, along with relative rates and earnings and it is held that the Pittsburgh district is more suitably located for a low rate than its competing districts.

Going into effect on the same day as the new Pittsburgh-Wheeling rates became operative, were reduced ore rates to the Beaver, Josephine, Johnstown, and Canonsburg districts of Pennsylvania, voluntarily made. It is thought, however, that these reductions could have been forced in accordance with the long-and-short-haul provision. They made the same absolute decrease, 8 cents per ton, as was made to the Pittsburgh district, the points of origin being Cleveland, Ashtabula, Lorain, Huron, and Newburg, O. Some of these tariffs are merely paper rates, inasmuch as vari-

ous points affected are served most directly by the Buffalo, Rochester & Pittsburgh Railway Co. from its New York ports, and it necessarily gets the tonnage when its rate is the lowest. This applies especially to the Josephine district. By the new tariffs applying from Ohio docks, Johnstown district is given a rate of \$1.02; Josephine district, 93 cents; Beaver district, 70 cents; Canonsburg district, \$1.20.

Included in the various districts given a new rating are the following:
Johnstown district: Connellsville,

ler, Verona, Kittanning, Hays, Munnhall, P., McK. & Y. transfer.

Demolish Theory

The demolition of the "assembling cost" theory, which was demanded before the Interstate Commerce Commission by the Youngstown Sheet & Tube Co. and 18 other Mahoning and Shenango valley iron and steel makers in their endeavor to have the valley ore-carrying rate reduced, seems now to have been accomplished, as shown by the new rates filed. This theory came into existence about 1883,

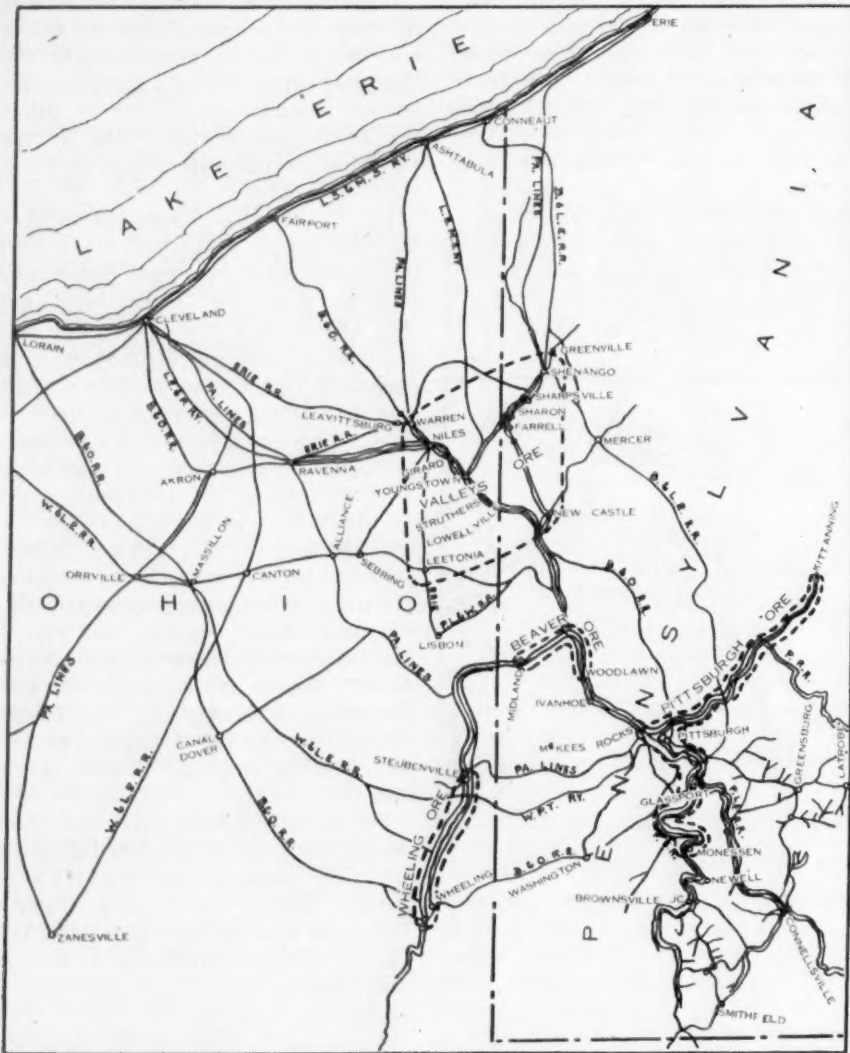
the Pittsburgh Steel Co.'s ore complaint, decided May 29 last, differs from the railroads in figuring out what that "assembling cost" at the various points actually was. For instance, the railroads figured that the freight cost of assembling 4,117 pounds of iron ore, 2,234 pounds of coke and 1,077 pounds of limestone at Pittsburgh was \$2.75. But in putting these figures together, as the commission points out in its Pittsburgh Steel decision, "a terminal allowance of 19 cents for these quantities was deducted in the cases of Pittsburgh and Johnstown, but not at the other points." The commission thereupon reconstructed the railroads' figures on "assembling cost" with the result that it figures the Pittsburgh "assembling cost" at \$2.885. The following comparison of the railroads' "assembling cost" figures for various pig iron making points, and the figures as reconstructed by the commission, will prove interesting:

	By commission.	By railroads.
Pittsburgh	\$2.885	\$2.75
Wheeling	2.795	2.82
Youngstown	2.706	2.74
Beaver		2.74
Canal Dover		2.86
Johnstown		2.86
Columbus		2.78
Zanesville		2.86

Taking the proposed 88-cent rate on iron ore into the Pittsburgh district, which went into effect Aug. 15, as likely to stand, this would mean, mathematically, that from the Pittsburgh "assembling cost" of \$2.885, as determined by the commission, will be deducted 22.94 cents, which is the proportional reduction agreed upon under the new ore tariff, thus making the new "assembling cost" of Pittsburgh pig iron something like \$2.656. In the case of the Wheeling district the process is a bit more complicated, for the ore rate has been advanced 28 cents a ton to 88 cents, which figured out mathematically gives an increase of 51.2 cents upon the above figured ore proportional necessary to make a ton of pig iron.

Increase in Cost

This addition would make the Wheeling pig iron cost \$3.307. From this total must be subtracted, however, about 10 cents a ton for coke since the B. & O. railroad on July 28-29 filed a new Connellsville coke rate to Wheeling, Steubenville and like points of \$1.20 a ton, replacing the rate of \$1.30 which had prevailed previously. Making this proportional reduction gives the new Wheeling "assembling cost" as \$3.207. For the "Beaver district", the proportional reduction would be 22.9 cents from the



MAP OF THE AFFECTED IRON AND STEEL DISTRICTS

Johnstown, Dunbar, Everson, Scott-dale.

Josephine district: Josephine, Irwin, Latrobe, Leechburg, Vandergrift, Apollo.

Beaver district: Aliquippa, Beaver Falls, Monaca, Woodlawn.

Pittsburgh district: Pittsburgh, Clairton, McKeesport, McKees Rocks, Co-raopolis, Lucas, Monessen, Rankin, Glassport, Bessemer, Neville Island, Carnegie, Donora, Brackenridge, But-

through agreement between railroads serving the Pittsburgh, Wheeling and valley districts, which in that period were the principal merchant pig iron producing points in the middle west. This theory, proposed, in brief, to place the blast furnaces located at these several points upon the same freight basis, so far as concerned the assembling of all materials that enter into the manufacture of pig iron.

The commission in its decision in

theoretical "cost" of \$2.74, which would make the new "cost" something like \$2.52.

In condemning the "assembling cost" theory, the Interstate Commerce Commission in the Pittsburgh Steel case uses this language, which makes plain its position:

"The only attempt made by defendant (the railroads) seriously to justify this difference * * * * in the rate, as emphasized by counsel for the complainants, is an appeal to the equalization theory, which we have condemned. We find nothing in this record to justify this discrimination."

The series of freight rate complaints which have been before the Interstate Commerce Commission for the past two years, and upon which the commission has been making decisions for the past few months, and upon which new tariffs are now being filed by the railroads as pointed out previously, involve a large volume of Lake Superior iron ore, Pittsburgh coal and Connelville coke. The total ore traffic involved amounts to 12,500,000 tons annually; the coal traffic, to 12,600,000 tons; and the coke traffic, to 18,600,000 tons as disclosed in figures presented in briefs filed with the Interstate Commerce Commission.

Lake Shore Started It

The New York Central lines, through the Lake Shore & Michigan Southern railroad, were the first to inject a new element into the controversy which seeks the demolition of the "assembling cost" theory when on July 23 they filed a new tariff to apply to the Beaver, Pa., district, cutting the ore-carrying rate from lower lake ports to Aliquippa, Pa., from 78 cents a ton to 70 cents a ton on "direct" ore. It was proposed further that this tariff take effect August 15.

The Erie railroad on Aug. 2 filed a new tariff from Cleveland also to Aliquippa, reducing the rate from 78 cents to 70 cents.

Both the New York Central and Erie new rates became effective Aug. 15, by special permission of the Commerce Commission.

This 78-cent rate to the Beaver valley points until that time had included ore destined to the blast furnaces of the Jones & Laughlin Steel Co. at Aliquippa, and of the Crucible Steel Co. of America at Midland, Pa.

On Aug. 12 the Wheeling & Lake Erie railroad filed a new tariff, effective Sept. 15, cutting the 88-cent ore rate to Steubenville and Mingo Junction, O., the latter being almost a suburb of Steubenville. Nothing was said in this new tariff about reducing the rate to Wheeling and Martins

Ferry, O., thus leaving the 88-cent ore rate effective today, in effect so far as these two points are concerned.

The curious position in which the Pennsylvania railroad is left by these proposed tariffs is worth mentioning. The Pennsylvania lines propose to maintain the 88-cent ore rate, effective Aug. 15, to both Steubenville and Mingo Junction as well as to Wheeling and Martins Ferry. But it may ask the commission to allow it to take Steubenville and Mingo out of the "Wheeling district" and to put them into the "Beaver district". If this be allowed, it will give Steubenville and Mingo a 78-cent rate via the Pennsylvania lines, but a 70-cent rate via the Wheeling & Lake Erie. It is obvious that such a double rate arrangement will not stand, and that ore rates will be made for what now seems probable as a "new Beaver district".

In effect, the making of a 70-cent rate to Steubenville and Mingo by the Wheeling & Lake Erie line and the reduction of the rate by the New York Central lines to Aliquippa of 70 cents, make for an anomalous situation at present in the present "Beaver district". The practical effect of the Steubenville and Mingo Junction reduction to 70 cents is to take these two points out of the "Wheeling district" and put them into the old "Beaver district", together with Aliquippa and Midland, Pa. But the Pennsylvania lines are the only railroad serving the Crucible Steel Co.'s furnaces at Midland and the Pennsylvania lines are maintaining so far the 78-cent rate to Midland. So that although the "Beaver district" has been practically extended by one railroad to include Steubenville and Mingo, yet the curious spectacle is presented of Aliquippa at the eastern extremity of the "Beaver district" having a 70-cent rate and Steubenville at the western extremity having a 70-cent rate, but Midland, Pa., which is right in the center of the "Beaver district", geographically, is held to the 78-cent rate.

Means New District

If these present proposed rates are allowed by the commission to stand, it will mean that the "Wheeling district", which for many years has included Steubenville and Mingo Junction, will be confined only to Wheeling, Bellaire, O., and Martins Ferry, O. The "new Beaver district" will cover about twice the territory that it formerly covered and will include Aliquippa, Midland, Steubenville and Mingo Junction, which are almost exactly on a horizontal line, geographically, as compared with the shore of Lake Erie from which all these points

secure their stores of Lake Superior ore.

Last week representatives of a number of the railroads involved in the Ohio river rate situation called informally upon Chairman Clark, of the Interstate Commerce Commission, at Washington, and discussed the general questions. The Pennsylvania railroad, it is understood, desired to learn whether it would be allowed by the commission to take Steubenville and Mingo Junction out of the present "Wheeling district" and put them into the new "Beaver district" by giving them the identical rate that obtains in the "Beaver district." Chairman Clark, it is understood, pointed out that members of the commission are widely scattered over the country, but that they will assemble again in Washington about Sept. 15. The suggestion was made that the Pennsylvania lines file the proposition before the commission in whatever shape is desired for its consideration and it is likely that some agreement can be brought about. It is not unlikely that the proposal to make the additions to the "Beaver district" will be filed in connection with the present pending Pittsburgh Steel Co.'s ore complaint.

Steel Works Railroad

The sale of the Sparrows Point railroad of the Pennsylvania Steel Co. to the Philadelphia, Baltimore & Washington Railroad Co. has been approved by the public service commission of Maryland. The Sparrows Point railroad is five miles long and connects the works of the Maryland Steel Co. at Sparrows Point, Md., with the Philadelphia, Baltimore & Washington railroad at Colgate Creek, Md., through the Union railroad.

Extending Wire Plant

A considerable extension of capacity of the wire rope department of the Trenton, N. J., plant of the American Steel & Wire Co. has been ordered. These improvements will entail an expenditure of about \$100,000, and appropriations have been made by the company for that amount.

R. E. Bebb, president and general manager of the Canton Stamping & Enameling Co., Canton, O., states that that company will not be a member of the merger of Ohio stamping and enameling works. He advises that the company, with others, bought certain stock in the Massillon Rolling Mill Co., which company will continue operating as heretofore.

IRON MINING NEWS

Active Season on Cuyuna Range

Many thousands of dollars are being expended on the Cuyuna range this season in exploratory work. So far as operations of this character are concerned, the Cuyuna is the most active of all the Lake Superior iron districts. Many drills are in commission. Development work is in progress at several properties not yet on the shipping list, and it is evident that next year the range will be prepared to produce a tonnage not inconsiderable for a zone still in the infantile stages of its career. The Cuyuna output this season probably will approximate 1,000,000 tons. Next season the district doubtless will send out not far from 2,500,000 tons, in that respect passing the much older Vermilion range. The biggest shipper in 1914, it would appear from present indications, will be the Tod-Stambaugh Co.'s Pennington mine. This property is being developed as an open pit, and, if deemed advisable, could be put on the producing list almost any time. The property which the Pittsburgh Steel Ore Co. is stripping at Riverton by the hydraulic process also will be prepared to produce heavily next season.

It appeared formerly that the Cuyuna would be a range of underground mines exclusively. The open-pit system has now been found advantageous in various localities, and in several instances the overburden is to be removed where it first was believed only shaft mining was feasible. Both the Thompson mine of the Inland Steel Co. and the Armour No. 2 property of the Rogers-Brown interests are to be transformed from underground propositions to open pits. The problem of concentrating low grade ores is also being given attention and the installation of plants for this purpose is in contemplation at various mines. Large quantities of ore on the Cuyuna are unprofitable to ship as found in the ground, and either by a washing or a blasting process much of this material doubtless will be made merchantable. A test with Cuyuna ore recently was made in a concentration works at Joplin, Mo.

Added to the list of Cuyuna shippers this year are the Cuyuna-Mille Lacs, the Cuyuna-Duluth, the Iron Mountain, to which the Soo Line has

recently, extended its railroad; the Adams, at Oreland, and the Barrows, near Brainerd. The latter is a property of M. A. Hanna & Co., Cleveland. Older shippers are the Kennedy and the two Armours, of Rogers, Brown & Co., and the Thompson. The Kennedy is being provided with a full electrical equipment, including an underground haulage plant.

To Improve Mining Location

The Montreal Mining Co., operating in the Wisconsin part of the Gogebic range, has awarded a contract for the erection of an office building, 20 houses for mine employes and a residence for the superintendent. Ten miners' dwelling houses at Ramsey and ten at Wakefield, also on the Gogebic, will be built by the Castile Mining Co., the activities of which are on the Michigan side of the Montreal river. The contracts for all of this work have been given to the Foster Construction Co., Milwaukee. Operations will be rushed, in the hope of completing the work before the advent of severely cold weather. At Ironwood, metropolis of the Gogebic, the Foster company has under way much construction work for the Newport Mining Co.

Will Inspect Mesabi Range

A thorough inspection of the Mesabi range, from Biwabik to Coleraine, will be made by members of the Lake Superior Mining Institute during the 18th annual meeting, to be held Aug. 26-30. Trips also will be made to the plant of the Minnesota Steel Co., now under construction, and to the concentrating plant at Coleraine. Business sessions will be held at Virginia and Coleraine.

Copper Miners Find Work

Many miners thrown out of employment in the Michigan copper country on account of the labor strike in that region are finding work in the iron districts, notably on the Gogebic range and in the Iron river field of the Menominee.

The Spring Valley Mining Co.'s Zimmerman mine at Iron River, is employing 200 men. Little or no ore is being sent out at present, but the stockpile is growing.

Athens Mine Promising

While a start has been made with the work of opening the Athens mine at Negaunee, Marquette range, it probably will be two years hence before the property is in a position to produce ore in any great quantity. The initial depth of the shaft will be 2,200 feet. The first 40 feet of this is overburden, which has already been penetrated and which will be walled with concrete 1½ feet in thickness. The concrete will extend well into the ledge. Eventually, drifts will be driven to the Cleveland-Cliffs Iron Co.'s Negaunee mine, a few hundred feet northeast. The Cleveland-Cliffs company and and Pickands, Mather & Co. are jointly interested in the Athens, and will develop and operate the tract as the Athens Mining Co. Unofficial estimates of the size of the deposit place it all the way from 2,000,000 to 5,000,000 tons. The ore is further understood to be of the best grade. The larger part of the tract, this part comprising 22 acres, originally was owned by Mrs. Mary Gaffney, of Negaunee. Mrs. Gaffney transferred her interests outright to Geo. A. St. Clair, of Duluth, several years ago for a reported consideration of \$100,000, and the latter, in turn, conveyed his deeds to the Athens company on a royalty basis. The royalty is understood to be \$1 a ton or thereabouts. The existence of ore was revealed by diamond drilling, exploration of which nature still continues. Temporary buildings have been constructed. Next spring a permanent power house, shops and other structures, contracts for which have already been awarded, will be erected.

Will Operate Columbia Mine

The petition of the Interstate Iron Co. for the vacation of certain streets in Virginia, Minn., which was refused a month ago, has been reconsidered and granted. The consideration fixed for the vacation is \$4,000. The Interstate company will develop the Columbia mine. The site is covered with dwellings which will be moved to other parts of the city.

Frank Samuel, of Philadelphia, sailed last week on the *Imperator* for an extended trip through the British Isles and Continental Europe.

MEN OF THE IRON TRADE

The Pennsylvania Railroad System announces several changes in its personnel, taking effect during the past month. Following the death of Daniel S. Newhall on July 12, after fifteen years' service as purchasing agent, Samuel Porcher was appointed to that important position on July 21.

MR. FORCHER was born in South Carolina, Dec. 21, 1857, graduated at the University of Virginia in 1881, and entered the machine shops of the company in 1882. He went through a full shop course, including the test department, and was transferred in 1888 from the mechanical engineer's office to the office of the superintendent of motive power in Jersey City. In July of that year he was appointed assistant engineer, motive power department, United Railroads of New Jersey division, in which position he remained until March 1, 1894, when he was appointed assistant purchasing agent of the Pennsylvania Railroad Co.

J. L. CUNNINGHAM, promoted to master mechanic at Wilmington, Del., on July 1, was born in 1874, graduated at Purdue University in 1900, since which time he has been with the Pennsylvania system.

C. D. PORTER, appointed assistant engineer of motive power in the office of the general superintendent of motive power at Altoona, Pa., was born in 1883, graduated at Purdue University in 1902, since which time he has been in the employ of the Pennsylvania system.

F. S. ROBBINS, appointed assistant master mechanic at Twenty-eighth street, Pittsburgh, was born in 1880, graduated at Purdue University in 1906, since which time he has been in the employ of the Pennsylvania system.

Other changes include the promotion of J. H. Thomas to be assistant general foreman at Pitcairn, the appointment of W. F. Miller as supervisor and assistant train master at Lewisburg, Pa., the appointment of H. M. Grimm as assistant supervisor on the New York division, H. H. Kauffman as assistant supervisor at York, Pa., and J. E. Kirk and W. R. Flounders as freight solicitors.

S. M. KIER, president of the Kier Fire Brick Co., Pittsburgh, sailed last week for Europe.

JOHN J. CAINE, Philadelphia, iron and steel dealer, has gone to Europe for a stay of several weeks.

HARRY R. JONES, secretary of the United Steel Co., Canton, O., is in Michigan for three weeks' fishing.

E. R. MOTCH, secretary, Motch & Merryweather Machinery Co., Cleveland, is away for a two weeks' vacation.

W. T. JAMESON, of the Monitor Furnace Co., Cincinnati, is spending time in Canada in the interest of his company.

JACK THURSTON, formerly with the Olympic Foundry Co., Seattle, is now with the Mainland Iron Works at Vancouver, B. C.

F. E. HOWLES has been appointed superintendent of machine shop for the Pennsylvania Steel Co., Steelton, Pa., to succeed S. D. Ogden.

W. A. CASEY has been appointed municipal engineer of Esquimault, B. C. He was formerly on the staff of C. H. Topp, C. E., of Esquimault.

H. E. KELLY, sales manager and treasurer of the Portage Silica Co., Youngstown, O., has resigned to become assistant manager of the Falcon Bronze Co., Youngstown.

JAMES D. ROBERTSON, organizer of the

Warren Tool & Forge Co., Warren, O., has returned to the Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, of which he is now vice president. Mr. Robertson left that concern two years ago to join the Pittsburgh Piping & Equipment Co.

FREDERICK L. SIVYER, the well known Milwaukee foundryman, and Mrs. Sivyver, are enjoying a two weeks' trip around the great lakes on one of the big freighters.

C. P. LEIBLEIN, of Strong, Carlisle & Hammond Co., Cleveland, is spending a two weeks' vacation at various points on the lakes.

W. BERKLEY WILLIAMS has been elected vice president of the Alabama Co., which purchased the properties of the Alabama Consolidated Coal & Iron Co. at foreclosure.

CHARLES M. SCHWAB, president of the Bethlehem Steel Corporation, has been made a director of the American Locomotive Co., succeeding C. A. Coffin, who resigned last December.

A. W. TAIT, president of the British Aluminum Co., with extensive works in Great Britain and the European continent, and interested in several large electrical enterprises, is traveling in Canada.

LINDSAY N. B. CAMPBELL, formerly connected with the Vulcan Iron Works, Seattle, Wash., and the Northwest Steel Co., Portland, Ore., is now superintendent of construction at the West Coast Steel Works, Tacoma, Wash.

CHARLES H. DAKER, who has been connected with the iron and steel industry in Pittsburgh for a number of years, is now associated with Matthew Addy & Co., in the sales department, Farmers Bank building, Pittsburgh.

O. G. BRICE, president of the Wisconsin Refrigerator Co. of Eau Claire, Wis., was honored by election as vice president of the National Refrigerator Manufacturers' Association, at the annual convention held in New York City recently.

JOHN WALKER, of Scranton, Pa., has been appointed head of the fire prevention bureau of the department of labor and industry of Pennsylvania and inspections to enforce the fire escape law are being inaugurated throughout the state.

GEN. OTTO H. FALK, president of the Allis-Chalmers Mfg. Co., Milwaukee, has just returned from a week in eastern Canada, where he transacted official business concerning the Canadian works of Allis-Chalmers. Mr. Falk said there is nothing new in the affairs of the company, but that the officials are now engaged in the preparation of a financial statement showing the result of operations since April 1, the day on which the reorganization was made effective.

JOHN GOETZ has been promoted to the position of superintendent of works of the Kempton Mfg. Co., milling machines, Milwaukee. Mr. Goetz has been for several years in charge of the tool room and light manufacturing operations for the Kempton company.

HERMAN WARNKEN, for thirty-six years an employe of the Gehl Bros. Mfg. Co., West Bend, Wis., has been promoted to the position of superintendent of the casting floor and casting stock room. Mr. Warnken is considered one of the most expert molders in the middle west.

JOSEPH SILLMAN, of the Michigan Smelting & Refining Co., Detroit; C. M. Loeb, vice president of the American Metal Co., New York City, and Robert W. Conklin, agent of the Granby Mining & Smelting Co.,

New York City, have been elected members of the New York metal exchange.

H. S. SNYDER, vice president of the Bethlehem Steel Corporation, has returned from a trip to Scotland, where he had gone to consult with British ship builders over the building of a number of ore freighters which the company is planning for transporting iron ore from its Chilean properties to this country.

GEORGE BEST, who for 12 years was president of the Best Mfg. Co., Pittsburgh, has severed his connection with that company and, with his son, George H. Best, has organized the Best Pipe Engineering & Supply Co., with offices at 3026 Liberty avenue, Pittsburgh. The new concern will design and furnish pipe for varied requirements and pressures.

PROF. J. M. GOLDSTEIN, of the Moscow high school of commerce, has arrived in Canada. He has been commissioned by the Russian government to investigate conditions in Canada, with the object of promoting commercial relations between the two countries. Russia furnishes a market for Canadian agricultural machinery and steel goods in return for dairy and other agricultural produce.

M. R. D. OWINGS has resigned as manager of the advertising department of the International Harvester Co. of America, after ten years' service, to take up an important position with another company. He is succeeded by F. W. Heiskell, for two years assistant advertising manager and prior to that time was assistant general agent for the company at Indianapolis. A. C. Seyfarth succeeds Mr. Heiskell.

CHARLES L. ROGERS, former president of the Sligo Furnace Co. and the Sligo & Eastern Railroad Co., accompanied by Mrs. Rogers, will sail on the steamship Mauretania, Aug. 20, for London. Mr. Rogers goes abroad as the representative of the American Car & Foundry Co. to take charge of its foreign business. Before going to St. Louis, Mr. Rogers was district manager of the car and foundry company's plant at Milton, Pa. James Buick has succeeded him with the furnace and railroad company.

T. J. PETERSON has resigned as president and general manager of the Peterson-National Co., Buffalo, manufacturer of core oil, dry core compound and parting. Mr. Peterson will continue to be affiliated with the selling department of the Peterson-National Co., and he retains his interest in the company. James Johansen has been appointed assistant treasurer and purchasing agent, with headquarters at Chicago, and John Purvis continues as manager and also will serve as purchasing agent at the Buffalo plant.

HERR E. SCHALTENBRAND has resigned as managing director of the Stahlwerks-Verband, of Dusseldorf, popularly known as the German Steel Syndicate, and has taken a position with the Hohenlohe interests in upper Silesia. The Hohenlohe company is very largely interested in zinc works and coal mines and controls both rail and transportation companies. Herr Schaltenbrand has been very well known among leading steel makers of the United States by reason of his prominence in the affairs of the German Steel Syndicate. He was among the guests of the American Iron & Steel Institute at the meeting in New York City in October, 1910, when thirty foreign iron and steel masters were entertained and international trade subjects were discussed.

NEW BUSINESS

The machinery market is holding up remarkably well for this season of the year and despite the general hesitancy which has existed for some months on account of pending tariff legislation. In the large business centers, there appears to exist among both dealers and manufacturers a general belief that extensive buying will begin early this fall. No change is noted in the financial situation as affecting the trade.

In New York, less buying and fewer inquiries developed last week than since the summer dullness set in. Sentiment among sellers continues hopeful, however. Word has been received that the Blacksburgh Polytechnic School, Blacksburgh, Va., will take final action on its machine tool list, amounting to approximately \$50,000 next week. The Buffalo school authorities are being held up by lack of funds and it may be several weeks before they are prepared to place orders for the equipment for the technical high school building. Bids are asked by the government until Sept. 16 on a large list of shop equipment for the Mare Island navy yard. This is in addition to former lists noted.

In Pittsburgh, machine tool dealers advise that conditions continue fairly active, although most of the transactions being closed involve only single orders. Consumers show hesitancy in placing large orders, although dealers believe conditions will improve in the early fall. Builders of heavy rolling mill machinery have a large number of attractive orders on their books, but new inquiry is light.

In Cleveland, dealers state that the machinery market continues fairly active, despite the season. New inquiries are scarce, but single orders aggregate a fair volume, while several large inquiries

that have been before the trade for months show signs of early closure. Builders have orders booked ahead for several weeks' operation. Supplies and second hand machinery in fair demand.

In Philadelphia, machinery dealers report that sales were satisfactory last week, the volume of business continuing about the same as during July and the first week in August. The Pennsylvania railroad has closed for an additional 10 or 12 machine tools against its list of several months ago. Inquiries for new machinery are quiet. The second hand machinery market is dull.

In Cincinnati, the machinery situation remains unchanged with very little activity being manifested in any of its branches. Only one jobbing foundry, the Modern Foundry Co., in Oakley, is running at the present time on account of the iron molders' strike now in progress here. Three or four machine shops have closed down until further notice on account of inability to secure sufficient orders, and others are running either on old orders or on a few recent ones that have been taken, mostly from foreign territory. The local teamsters' strike is also being felt here to a marked extent as very few deliveries can be made. Second hand machinery is dull and small electrical equipment is selling only in fair lots.

ALABAMA

ANNISTON.—The Lynchburg Pipe & Foundry Co. will begin operating its soil pipe works in about two months.

CALIFORNIA

SAN DIEGO.—The California Iron Works is planning to start work soon on its new plant on the tidelands at the foot of Seventh street. A machine shop and foundry, 70 x 180 feet, of corrugated iron with concrete foundations, will be the first building erected. The present plant is located on Eleventh, between M and N streets. Fred Baker and Warren C. Kennedy of the Baker Iron Works, Los Angeles, are president and secretary, respectively, and John C. Ort, manager.

CONNECTICUT

HOTCHKISSVILLE.—The sale of the works of the American Shear & Knife Co. to Roswell A. Clark, of Clark Bros. Cutlery Co., Kansas City, Mo., has been approved by the court. Clark Bros. will combine the works with the Waterville Cutlery Co., works recently acquired, and operate the two at Hotchkissville.

STAMFORD.—The Electric Specialty Co., successor to the Engineering Electric Mfg. Co., has been incorporated with J. M. Wright as president. The company will manufacture alternating and direct current motors from 1-100 to 1½ horsepower capacity and generators and dynamotors of corresponding ratings.

DISTRICT OF COLUMBIA

WASHINGTON.—Bids will be received by the Bureau of Yards and Docks up to Sept. 20 for constructing seven magazine buildings

at the U. S. Naval station, Pearl Harbor, H. I., estimated cost \$126,000.

WASHINGTON.—Proposal for steel highway bridge across the San Juan river, Navajo Indian Reservation, New Mexico, and addressed to the Commissioner of Indian Affairs, Washington, D. C., will be received up to 2 o'clock p. m. Sept. 15.

WASHINGTON.—Proposals for furnishing steel turntable, galvanized iron and steel, steel wire, etc., will be received at the office of the general purchasing agent, Isthmian canal commission, until Aug. 29. Blanks and general information relating to these requirements (Circular No. 788) may be obtained from F. C. Boggs, major, Corps of Engineers, U. S. A., general purchasing officer.

GEORGIA

ROME.—The Hanks Stove & Range Co. is planning to move to its new plant in West Rome about Sept. 1. The four new buildings being erected by the company, of reinforced concrete and steel throughout, are nearing completion.

IDAHO

BOISE.—Bond issue amounting to \$58,000 to cover cost of main in Dist. No. 2 has been sold to the First National Bank of Columbus, O.

LEWISTON.—County Engineer Eugene Booth and Water Superintendent Wagner have estimated that a pipe line from Lake Waha to serve the city will cost \$150,000.

PRIEST RIVER.—This place has voted bonds in the sum of \$14,000 for constructing a system of water-works.

POCATELLO.—The city will vote Sept. 2 on the question of bonding in the sum of \$20,000 for building bridges across the Portneuf river.

SHOSHONE.—The sub-station of the Great Shoshone & Twin Falls Light & Power Co. has been destroyed by fire.

ILLINOIS

CHICAGO.—Plans are being laid by the Chicago & Eastern Illinois railroad for additions to rolling stock and equipment and completion of double track. About \$3,000,000 is expected to be spent.

DANVILLE.—The Danville Malleable Iron Co. opened its new plant for operation last week. Over 60,000 feet of floor space has been provided, and present plans show that the company expects to melt about 5,000 tons of pig annually.

INDIANA

EVANSVILLE.—The International Steel & Iron Co. suffered loss by fire at its plant here recently.

KOKOMO.—The Kokomo Steel & Wire Co., manufacturer of plain and galvanized wire fencing, barb wire, nails, etc., is making extensive additions to its plant. The new work includes open-hearth furnaces and a blooming mill. Bonds in the sum of \$400,000 have been issued to cover the cost of construction. The buildings for the new plant are now being erected; most of the machinery has been contracted for, but it will be some time before the installation of machinery commences.

MICHIGAN CITY.—The Haskell & Barker Car Co. has adjusted the loss it sustained by fire recently with insurance companies. The insurance companies paid \$439,120.

MASSACHUSETTS

BOSTON.—The Sub Target Gun Co. has been incorporated with a capitalization of \$300,000, by W. F. Whitney, president; Chas. O. Danforth, 110 Broad street, treasurer, and L. L. G. de Rochemont.

PITTSFIELD.—The General Electric Co.

has awarded the contract for a test building here to Fred T. Ley & Co., Springfield, Mass. The building will be of brick, concrete and steel, and will be erected in two sections. One section will be 120 x 380 feet, one story, the other will be 27 x 380 feet, one story. Levering & Garrigues, New York, have the contract.

QUINCY.—The new foundry on the A. B. Packard estate on Cottage avenue has been completed, and the old building is being removed. W. M. Packard, manager.

SPRINGFIELD.—United Electric Light Co., Springfield, is to build a reinforced concrete coal pocket at a cost of about \$35,000.

MICHIGAN

DETROIT.—The Detroit Metal & Steel Works has been incorporated with a capital of \$18,000 to deal in metals.

DETROIT.—William Liebig & Co. has been incorporated with a capital of \$60,000 to manufacture machinery.

DETROIT.—H. Collier Smith, manufacturer of rotary shears, 807 Scotten avenue, is having plans drawn for an addition to his plant, 37 x 100 feet, one story, of brick with steel roof supports and steel windows. Additional machine equipment will be needed, consisting of one planer, one plain horizontal milling machine, one 30-inch lathe, one 20-inch lathe and two 14-inch lathes. The machinery will be group driven by electric motor.

GRAND RAPIDS.—The Central Boiler Works has completed moving into its new plant here.

KALAMAZOO.—William E. Hill Co. advises it is asking for bids on a new machine shop, 80 x 300 feet.

SAGINAW.—Ground has been broken for the buildings of the American Cash Register Co. Walter Quallmann, contractor.

MINNESOTA

DULUTH.—The Saint Louis Power Co. has been incorporated to generate and deal in electric current; \$1,000,000; by Oscar Mitchell, J. B. Crane, A. C. Gillette, J. A. Sinclair and H. A. Carmichael, all of Duluth.

MISSOURI

ST. LOUIS.—The Palmer-Meyer Motor Car Co. has been incorporated to do a general automobile and specialties business; \$100,000; by Charles W. Palmer, F. C. Meyer and F. A. Meyer.

MONTANA

CARTERSVILLE.—J. H. Cunningham, civil and hydraulic engineer, Lumbermen's building, Portland, Ore., is preparing plans for two irrigation projects in this (Rosebud) county for the Cartersville Land & Irrigation Co. of Minneapolis. A pumping station for a 12,000-acre tract and another for a 2,100-acre tract will be required.

KALISPELL.—This place will hold an election Sept. 3 on the question of bonding in the sum of \$212,000 for constructing a municipal water system. City Engineer Marsh has the matter in hand.

MISSOULA.—The Seattle office of Charles C. Moore & Co., engineers, has the contract for installation of Stirling boilers, manufactured by Babcock & Wilcox, piping, heating, etc., in the reconstruction of the steam heating plant of the Missoula Light & Water Co. at this point.

MISSOULA.—The Seattle office of the American District Steam Co., E. L. Barnes, manager, general office and works, North Tonawanda, N. Y., has closed a contract for installing a steam heating system in the business section of this city for the Missoula Light & Water Co. The contract amounts to \$50,000. The iron pipe and special devices such as variators, special fittings, traps, etc., will be shipped from the east. The insulation will be manufactured at Tacoma. About one mile of pipe will be used.

NEW JERSEY

CAMDEN.—The Keystone Leather Co., Seventeenth and Stevens streets, has obtained permits to build a four-story warehouse, 68 x 165 feet; a one-story boiler house, 60 x 100 feet; and a one-story engine room, 50 x 85 feet. William Steel & Sons Co., Philadelphia, is the engineer.

NEWARK.—The Public Service Electric Co. has plans to build a power plant at

Burlington, N. J., and bids are being received on the construction work.

NEWARK.—Kaltenbach & Stephens will erect a three-story manufacturing plant at Sherman avenue and Bigelow street, estimated to cost \$25,000.

NEWARK.—A large addition will be made to the plant of the Zeh & Hahnemann Co., manufacturer of stamping and power presses. The building will be erected on property recently acquired on Vanderpool street, which adjoins the company's plant.

PERTH AMBOY.—The property at the foot of Garden street recently leased to the Hampton Kerosene Carburetor Co., of New York City, will be improved by the establishment of a plant for the manufacture of oil carburetors and motor appliances, including a foundry, machine shop and a brass-finishing department.

TRENTON.—The Woven Steel Hose & Rubber Co., last week started rebuilding its plant recently burned.

NEW YORK

FALCONER.—The Falconer Iron Works has been incorporated to operate general iron works and machine shop, to repair automobiles and conduct garage; \$15,000; by G. L. Gilbert, J. C. Wright and J. S. Wright, all of Falconer.

NEW YORK CITY.—The Steel Products Enameling Co. has increased its capital from \$91,000 to \$110,000.

NEW YORK CITY.—The Neptune Meter Co., 90 West street, advises all equipment has been bought for its two buildings just erected at Long Island City, L. I. One building is 72 x 175 feet, five stories. The other, a foundry, is 100 x 125 feet.

NEW YORK CITY.—Local machinery dealers have been advised that the S. Flory Mfg. Co., Bargar, Pa., are having plans prepared for rebuilding the plant, which was destroyed by fire Aug. 1. A large foundry and extensive machine shops will be the principal buildings.

NEW YORK CITY.—Bids will be taken by the board of water supply, gas and electricity, Sept. 2, for a hydro-electric power equipment of 250-kilowatt capacity to be installed at the lower gate and the screen chambers of the Ashokan reservoir at Olive, N. Y., and also for a complete portable power plant consisting of an oil or gasoline driven motor generator set, a switch board and one motor-driven air compressor.

SOLVAY.—The contract has been awarded for the structural material for the addition to the Frazier & Jones Co. foundry, and construction will commence shortly. The new building will be 90 x 146 feet with a wing 100 x 160 feet.

OHIO

CINCINNATI.—As a result of the numerous strikes that have occurred in Cincinnati recently, building operations in that city in July of this year fell off 40 per cent in comparison with the same month last year. In July, 1913, building permits issued in Cincinnati amounted to \$582,430, while in July, 1912, they amounted to \$971,214.

CINCINNATI.—A commission is to be appointed soon by Mayor Hunt, of Cincinnati, to construct a municipal convention hall building to cost about \$250,000. The architect to prepare the plans will probably be G. W. Drach, of that city. The building will be used to exhibit throughout the entire year products of the different manufacturing plants in the city.

CINCINNATI.—The G. A. Schacht Motor Truck Co., Cincinnati, is now running at full capacity at its temporary plant on Spring Grove avenue, which was formerly occupied by the Talbott Iron Co. The company will manufacture only light motor trucks, and is planning to either secure a new factory building in the future, or to add to the one now occupied by it.

CINCINNATI.—The Boye & Emmes Machine Tool Co., Spring Grove avenue, Cincinnati, has closed down for a time pending the iron molders' and teamsters' strikes. Castings cannot be secured and deliveries in the city or to and from the railroads have been seriously delayed. All this, in connection with the fact that very little business is being received by the machine tool manufacturers here at the present time, has caused a curtailment of operations.

CINCINNATI.—The following contracts involving an expenditure of \$90,000 have been let for the mechanical equipment for the new 12-story building now being erected by the

Cincinnati and Suburban Bell Telephone Co. at Fourth and Hammond streets, Cincinnati: The power plant, engines, generators, switch boards and general electrical system to the Devere Electric Co., Cincinnati; the heating, ventilating and power piping to the Oliver Schlemmer Co., of Cincinnati; the boilers, of which there will be two, to the Edge-Moore Iron Co., and the mechanical stokers to the Murphy Iron Works.

CINCINNATI.—It has been announced officially that the new 34-story office building of the Union Central Life Insurance Co., at Fourth and Race streets, Cincinnati, will be completed Sept. 1. Some of the offices are already occupied, but the others will not be ready before the above date. The building is the highest of its kind in the west, and was erected under the supervision of the Thompson-Starret Co., of Philadelphia. It contains about 7,000 tons of structural steel and was to have been finished on May 1, of this year, but on account of an epidemic of strikes a delay of several months was necessary. The Thompson-Starret Co. has announced that on this account it will not bid again upon any work in Cincinnati.

CLEVELAND.—The Kouyoumjuan Electric Mfg. Co. has leased two upper floors of a factory building on Ashland road, Cleveland, which has been held under lease by the Kurtzner Radiator Co. The Kouyoumjuan makes electric generators. Haroutum Kouyoumjuan, president; Robert Williams, manager, and B. W. Brockett, secretary.

COLUMBUS.—The Brightman Mfg. Co. advises that it has no intention of building a branch plant at Shelby, O., as stated in this section last week.

COLUMBUS.—The Adjustable Coupler Co. has been incorporated to manufacture metal couplers for wire fences and other uses; \$25,000; by Meldrum Gray, D. N. Postlewaite, Wm. R. A. Hays, S. P. Outhwaite and Harrison B. Barringer.

CONNEAUT.—The Pittsburgh & Conneaut Dock Co. is equipping an electric repair shop. The building has been completed and machinery is being installed. The building is 48 x 96 feet, of reinforced concrete construction.

HAMILTON.—The Anderson Tool Co., of Anderson, Ind., and Hamilton, has been re-incorporated under the laws of the State of Ohio, and will probably move its offices to Hamilton within the near future. The company has been operating plants in both cities with the main offices at Anderson. It is understood that under the new plan the foundry will be left at Anderson, and the office and main works at Hamilton.

OREGON

ASTORIA.—The Port of Astoria has passed an ordinance providing for the issuance of \$300,000 30-year five per cent bonds. These bonds to the extent of \$200,000 will be marketed at once for purchasing sites and building docks.

BAKER.—Plans prepared by Stannard & Richardson, engineers, Portland, for a municipal lighting plant have been adopted and steps will be taken at once for erecting same.

LA GRANDE.—The La Grande Foundry & Machine Co. is planning to move its shops from the present location to another recently purchased.

LINNTON.—The contract for laying the sewer system in this town has been awarded to James Kennedy Construction Co., Portland, for \$22,399.40. The contract for the reservoir and pumping plant was given to the same company for \$13,673.50.

NYSSA.—The contract for the erection of a tank and tower for the water system has been awarded to C. W. Cochran, of the Chicago Bridge & Iron Co., for \$4,200.

OREGON CITY.—Bids will be asked soon for sewer system according to plans just prepared by Chas. S. Noble, city engineer. Plans call for 10,000 feet of 30-inch trunk sewer and approximately four miles of lateral sewer ranging from eight to 24-inch.

PORTLAND.—Bonds are soon to be offered for sale to the extent of several hundred thousand dollars for water-works extension in various parts of the city.

PORTLAND.—Bids will be received by T. J. Morrow, major engineers, U. S. Engineer's office, Portland, up to Aug. 30, for furnishing 4,800,000 pounds steel rods for concrete reinforcing.

PORTLAND.—Bids will be received by Auditor A. L. Barbur, this place, up to Aug. 23 for the purchase of \$75,000 in water bonds, proceeds to be used in building a pipe line or conduit from head works to city.

PENNSYLVANIA

BEAVER FALLS.—The Keystone Driller Co., manufacturer of a line of deep well pumps, is erecting a new steel and brick forging shop 60 x 300 feet.

ERIE.—The Erie County Electric Co. is planning to increase the capacity of its plant, which includes the construction of a building, 85 x 100 feet, of reinforced concrete construction, and a reservoir on Cascade creek, west of the city, with a capacity of 1,500,000 gallons. Charles H. Strong is president of the company.

HARRISBURG.—The Elliott-Fisher Type-writer Co. will build an additional plant here to cost \$500,000.

HARRISBURG.—Notices of increase of capital stock have been filed at the state capitol as follows: Allegheny Steel Co., Pittsburgh, stock \$3,000,000 to \$3,090,000; Erie County Electric Co., Erie, stock \$250,000 to \$400,000; Ladalia Coal Co., Johnstown, stock \$5,000 to \$10,000; Boswell Lumber Co., Ligonier, stock \$100,000 to \$170,000.

McKEES ROCKS.—The Pittsburgh & Lake Erie railroad has placed an order with the Rosedale Foundry & Machine Co., Pittsburgh, for the installation of Playford chain grates for the operation of three 450-horsepower boilers.

MT. JOY.—The Gray Iron Casting Co. has been incorporated; \$25,000; by John S. Jenks, Philadelphia, and John E. Snyder, Lancaster.

PHILADELPHIA.—John T. Windrum is preparing plans for a sub-station to be built by the Philadelphia Electric Co., at Sixty-fifth street and Paschall avenue.

PHILADELPHIA.—At a fire which practically wiped out the plant of the Union Petroleum Co., the flames were communicated to the plant of the Homer Brass Co., across the street. The crane department of the Niles-Bement-Pond Co., also located nearby, was seriously endangered, but escaped damage.

PITTSBURGH.—The Pittsburgh Steel Co. has ordered a turbine-driven boiler feed pump consisting of a Kerr Economy turbine driving an Epping-Carpenter centrifugal pump.

PITTSBURGH.—The Crucible Steel Co. of America is taking estimates on the installation of water tube boilers for La Belle plant of the company. Boilers will be operated by automatic stokers.

PITTSBURGH.—The Kerr Turbine Co., Wellsville, N. Y., has received an order from the Columbia Plate Glass Co., Blairsville, Pa., for a 300-kilowatt mixed pressure Economy turbine.

PITTSBURGH.—The Westinghouse Airspring Co. is increasing its capital stock from \$2,000,000 to \$2,500,000. The company makes airsprings for automobiles and vehicles on a patent of George Westinghouse.

PITTSBURGH.—The Pittsburgh Railway Co. has ordered chain grate stokers from the Green Engineering Co., Oliver building. Stokers will be installed in the Brunots Island power plant, where they will operate 1,640 horsepower boiler capacity.

PITTSBURGH.—The Atlas Welding & Supply Co. has been incorporated at Dover, Del., to do a general business at welding and brazing of all kinds, \$25,000; by Joseph Gehring and Frank C. Pugh, of Pittsburgh, and James B. Anderson, Sharpesburg, Pa.

PITTSBURGH.—The C. H. Wheeler Mfg. Co., of Philadelphia, has received an order for complete condensing and cooling tower equipment for a 500-kilowatt low pressure turbine from the Pennsylvania Rubber Co., Jeanette, Pa.

PITTSBURGH.—The Forged Steel Wheel Co. has ordered three 1,000-kilowatt turbo-generator sets for its Butler, Pa., plant from the General Electric Co. The Alberger Pump & Condenser Co., New York City, was given the contract for condensing turbo and cooling valves.

PITTSBURGH.—The Pittsburgh Valve Foundry & Construction Co. has filled an emergency order for special valves for air piping purposes for the Ohio works of the Carnegie Steel Co., at Youngstown, O., where an explosion recently occurred in the gas-blowing engine house.

WHEATLAND.—Fire practically destroyed the pattern shop of the Sharon Foundry Co. Aug. 14. The loss is estimated at \$25,000.

WILLIAMSBURG.—The Penn Central Light & Power Co. is rushing work on its new \$1,000,000 power plant here, and will probably be in operation by the first of the year. Concrete is being used generously in the construction.

RHODE ISLAND

PROVIDENCE.—The American Carbide Production Co. has been organized under a Delaware charter with a capitalization of \$1,000,000, to manufacture calcium carbide and by-products; by Horace Davenport and Leonard W. Horton, both of Providence, and Cyrus D. Harp, of Cranston.

TENNESSEE

BRISTOL.—The Iron City Stove & Foundry Works has purchased the plant and business of the Dominion Iron Works, and the two plants are being merged. The Iron City company was organized by the George brothers, and has an authorized capital of \$150,000. The company proposes to manufacture stoves and heaters on a large scale.

ROCKDALE.—The Rockdale Iron Co., maker of ferro-phosphorus, advises the works improvements now being made are extensive. The old iron pipe hot blast stoves have been torn down and four White & Kernan brick stoves, 16 x 65 feet, are being built. Three 250-horsepower Rust boilers are replacing the old boilers. The furnace now has a "skip hoist" and the improvements being made will make the plant absolutely modern with the exception of the blowing engines.

TEXAS

HOUSTON.—The Vulcan Iron Works has been incorporated; \$16,800; by J. Wood, G. H. Brown and A. W. Albright.

UTAH

SALT LAKE CITY.—The Utah Power & Light Co. has started work on its plant, six miles west of here. The company has not announced its plans or probable cost of construction. P. B. Sawyer, vice president and general manager, and Markham Cheever, chief engineer.

WASHINGTON

BELLINGHAM.—The municipal committee on the building of a power plant on Nooksack river has reported favorably.

DAVENPORT.—The Davenport Mining & Development Co. has been incorporated here for \$200,000 by Wm. Allen, et al.

ENDICOTT.—Bids will be received by M. A. Sherman Jr., town clerk, up to Aug. 30, for the construction of a water system for the town. Specifications on file with clerk.

EVERETT.—Contract for the construction of new buildings of the Sumner Iron Works at this place has been awarded to the Everett Construction Co., a local concern, at \$31,844.

LEVENWORTH.—The North American Ore Co. has been organized with a view to developing a deposit of mica on the Mad river, some 25 miles from this point. M. F. Peak is president of the company, which is incorporated for \$100,000.

NORTH YAKIMA.—The armory board of the state has approved plans for an armory building here, and bids will be opened Sept. 16 for construction of same, cost \$65,000. Plans at office of Adjutant General Fred Llewellyn, Seattle, and chambers of commerce, Spokane and Tacoma.

OROVILLE.—The Okanogan Valley Power Co. has been organized with a capital of \$300,000, by Eugene Enloe and M. C. Barnes for furnishing valley with electric power.

SEATTLE.—The Ballard Marine Railway Co. has been incorporated here for \$25,000 by T. W. Smith and others.

SEATTLE.—United Metals Mining & Milling Co., of Seattle, has been incorporated for \$2,000,000, by W. C. Hubbard and others.

SEATTLE.—The Eagle Brass Co., 505 Railroad avenue South, recently installed a 2,000-pound capacity oil-burning furnace.

SEATTLE.—The Westernman Iron works, which was partially destroyed last May and rebuilt with new concrete buildings, suffered another fire loss of \$8,000.

SEATTLE.—Following a fire with a loss of \$20,000, President F. J. Rotch Sr., of Seattle Mill & Mfg. Co., says company will rebuild at once.

SEATTLE.—Plant of Latona Mill Co. has been destroyed by fire with a loss of \$20,000. President Robert S. Wilson says it will be rebuilt.

SEATTLE.—The Western Gear Works, R.

C. Frankie president, has installed the most modern machinery in its plant at 1706 Fourth avenue South, for cutting gears.

SEATTLE.—The J. C. Biegert Machine Works, manufacturer of mill, mine, marine and hoisting machinery, 2910 First avenue South, recently installed a new \$2,500 lathe.

SEATTLE.—The Isaacson Iron Works, operating a forging shop and iron works at the King street dock, has installed an oil plant equipment for boiler, forge and furnace.

SEATTLE.—The Variety Iron Works, which hitherto sold only to the machinery houses, has started selling its transmission and mill machinery to the trade direct also.

SEATTLE.—Contract for the ornamental iron and steel in the Ford motor plant here has been awarded to the Novelty Iron & Wire Works.

SEATTLE.—E. Johnson, manager Seattle Machine Works, Inc., announces that the construction of an erecting and pattern shop and store room is under consideration. The plant recently turned out two sets of engines for the White Pass & Yukon railway. These engines are being used on boats plying between Fairbanks and Whitehorse.

SEATTLE.—The Port Commission has ordered the engineering department to prepare plans for a \$50,000 ferry to operate between the north end of Harbor Island and the northern terminus of Kitsap avenue.

SEATTLE.—The engineering department of the Milwaukee railroad, this place, has awarded a contract for 13 miles of construction work on the Willapa Harbor road in southwest Washington, to the Keasel Construction Co., of Tacoma, at \$500,000.

SEATTLE.—The foundry of the Westerman Iron Works on the tide flats was gutted by fire recently, causing an approximate loss of \$10,000. A great portion of the machinery was ruined. The plant was only partially insured. Same will be rebuilt as soon as the adjustment is made.

SEATTLE.—The Pacific Coast Steel Co. is supplying the reinforcing steel for the Ford motor car plant being erected at Seattle and Portland, amounting to about 700 tons. T. S. Clingan, manager of the company, announces that preliminary plans are being worked out for the erection of two 40-ton open-hearth furnaces in order to increase the output of steel bars. Iron bars, reinforcing steel and light rails are the chief products of the plant.

SEATTLE.—Proposals have been issued by the local U. S. Engineers office, J. B. Cavanaugh in charge, for the two locks of the Lake Washington canal being constructed here. The nine gates will weigh 2,000 tons, the largest being 55 feet high, 47 feet wide for each leaf and the two leaves weighing 478 tons. Of the 2,230 tons of steel, cast iron, etc., 1,892 tons will be structural steel. The bids will be opened Dec. 29, and contract will call for delivery in one year.

SEDRO WOOLLEY.—The Western Engineering Co., 503 Railway avenue, Seattle, has awarded the contract for constructing the power plant at the Northern Hospital for the Insane at Norlum, near this place, at \$22,423.

SPOKANE.—The Spokane Auto Mfg. Co. has been incorporated by Edgar A. Torrance and others of Spokane, for \$50,000.

SPOKANE.—Iron Creek Mining Co. has been incorporated here by E. J. Merring, J. E. Angle and others for \$1,500,000.

TACOMA.—The West Coast Steel Works has bought a site near the Milwaukee railway line and will erect a larger plant soon. J. R. Turner is president.

TACOMA.—The Nisqually-Russel Car & Locomotive Works at Bismark, a suburb, will spend \$10,000 in new buildings and equipment. This plant has purchased plant of the Nisqually Iron Works. The first named company is a branch of the Russel Wheel & Foundry Co., of Detroit.

TACOMA.—The Keasel Construction Co., of this city, has been awarded \$500,000 contract for building part of Milwaukee Willapa Harbor extension.

TACOMA.—Bids are soon to be called for the construction of a 400-foot bridge across Gallagher's gulch to cost approximately \$14,000.

TACOMA.—The Atlas Foundry & Machine Co., manufacturer of mill machinery, marine appliances, boiler fronts, etc., contemplates rebuilding on a much larger scale as soon as conditions warrant. The company recently purchased the plant of the National Foundry and portions of same are being used in connection with the present plant. G. C. Dupea is president of the company.

TACOMA.—The Puget Sound Iron & Steel

Works, manufacturer of what is known as the "Tacoma" logging donkey engine, has extended its steel foundry 100 feet, making it 325 feet in length, and has put in annealing furnaces for the manufacture of manganese steel castings. Three hundred men are employed in the work and since the first of the year a night force has been working in order to keep up with orders for logging equipment.

VANCOUVER.—Clark county, Washington, has voted \$500,000 in bonds as its contribution toward building a steel bridge across the Columbia river. Multnomah county, Oregon, Portland the county seat, will vote in September on the question of bonding in the sum of \$750,000 as its share of the fund for constructing the bridge.

WISCONSIN

APPLETON.—The Killen-Walsh Mfg. Co., gasoline tractors, has started regular production in the former Double Power Wind Mill plant here. Preparations are being made for the construction of additions late this fall or early in 1914. The company does not build its own motors, these being supplied by the Waukesha Motor Co., Waukesha, Wis.

DODGEVILLE.—N. C. Miller and his son, William Miller, have organized as N. C. Miller & Son to engage in the manufacture of hay unloading and distributing machinery and farm machinery. The firm has purchased the Wisconsin Hotel property and is remodeling it into a factory, at the same time building an addition 50 x 100 feet. The company intends later to engage in steel structural work, bridge building, etc., and also to develop several inventions of differentials, universal joints, four-wheel drive and other automobile parts.

GREEN BAY.—The Green Bay Barker Co., manufacturing logging and lumbering machinery, is perfecting several new types of devices and plans to establish a branch plant in Canada.

JEFFERSON.—The Jefferson Auto Co. has been incorporated to manufacture automobile parts; \$6,000; by H. W. Paul, J. N. Heid and C. J. Puerner.

KAUKAUNA.—M. A. Lemke will erect a large building to be used by himself as an automobile garage and repair shop, and general machinery repair and sales agency.

MENASHA.—The Menasha Pump & Foundry Co. has been incorporated to manufacture

pumps, machinery, tools, etc.; \$50,000; by S. Kellum, W. A. Kerfoot and A. D. Paul, all of Menasha.

MILWAUKEE.—J. B. Erwin, 173 Twenty-fifth street, inventor of a fire extinguishing system adapted particularly to garages and oil warehouses, as well as machine shops, etc., is forming a company to manufacture the device.

MILWAUKEE.—The Milwaukee & Fox River Valley Railway Co. has increased its capital stock from \$25,000 to \$75,000 and changed the headquarters from Fond du Lac to Elkhart Lake, Wis. The company intends to build an electric railway from Cedarburg to Appleton, around the east shore of Lake Winnebago.

MILWAUKEE.—The Sternberg Mfg. Co., manufacturing motor trucks, has broken ground for a \$40,000 addition which will afford room for doubling the output of trucks. The building will be 150 x 150 feet, of brick and steel construction, with saw-tooth, steel-ribbed, transparent roof, and will be ready for occupancy Oct. 1. The present Sternberg works at Forty-seventh avenue and Burnham street, West Allis, were erected only three years ago and have now been outgrown.

SHEBOYGAN.—The C. Reiss Coal Co. awarded the contract for a new screening plant and other improvements to its River coal docks at Sheboygan to Heyl & Patterson, Pittsburgh. The screening plant will have a capacity of 200 net tons daily and is of the shaker type. The contract amounts to about \$20,000.

SUPERIOR.—The Pittsburgh Steel Ore Co. awarded the contract for the construction and equipment of a \$250,000 concentrating plant at Riverston, Minn., to the American Concentrator Co. It will be of steel and concrete. The plant will be the first of its kind on the Cuyuna range. There are two on the Mesaba range, one at Coleraine and the other at Nashwauk.

TWO RIVERS.—The Aluminum Goods Mfg. Co. has awarded the contract for the construction of a new rolling mill and central power plant at Two Rivers to the Majestic Construction Co., Milwaukee, which is in charge of new construction at the Manitowoc (Wis.) works of this company. The Two Rivers project includes the mill power plant, a main building, 44 x 370 feet, and the reconstruction of all frame buildings in brick and steel. Not all of this work will be done this year, but is to be distributed over the first half of 1914.

DOMINION OF CANADA

ALBERTA

EDMONTON.—The Freemasons will erect a \$500,000 eight-story building, of steel construction.

EDMONTON.—H. F. Brackenbridge has been awarded by the Wabamun Power & Coal Co the contract for cutting a 1,000-foot tunnel at its mine, which is one-half mile north of the Grand Trunk Pacific line.

BRITISH COLUMBIA

VANCOUVER.—Fire destroyed the plant of the Empire Engine Works, corner Sixth avenue and Alder street, Kitsilano, causing a loss of \$10,000.

VANCOUVER.—Bar & Anderson have been awarded the contract for heating, ventilating, plumbing, sprinkling systems, engines, generating plant, etc., for the Hudson Bay building here. Contract amounts to about \$200,000. The building will cost about \$1,750,000.

VANCOUVER.—McArthur Bros. Co., of New York City, has closed a contract with the Canadian Pacific railway for the construction of 38 miles of line beginning at a point 82 miles east of Vancouver and extending over the Hope mountains. Construction will be costly, approximating \$3,000,000.

VICTORIA.—Negotiations have been closed for construction of bridge at Johnson street to cost about \$400,000. The expense will be borne jointly by provincial government, Canadian Pacific railway and B. C. Electric railway.

MANITOBA

WINNIPEG.—Hazelton & Walling will erect a \$175,000 building for the Tribune.

WINNIPEG.—The Winnipeg and St. Boniface Harbor Commission has been assured that the Dominion government will give a

subsidy of \$100,000 towards improving the harbor facilities on the Red river.

ONTARIO

BRAMPTON.—The Erindale Light & Power Co. has applied to the Toronto Township council for permission to raise \$50,000 on property to complete dam and generate 500 more horsepower. At present, only 400 horsepower are generated.

BRANTFORD.—Industrial Commissioner Emerson states that the Coniagas Reduction Co. will move its plant from Thorold, Ont., to this city. The new plant which the company will build, will mean an outlay of \$250,000.

BRANTFORD.—The Brantford Machine & Foundries, Ltd., advises its foundry now building will cost \$40,000, including full equipment. The company intends to manufacture high grade castings. It has obtained the services of a man who has been one of the leading founders of the United States for many years, as superintendent.

HAMILTON.—A fire which broke out on the evening of Aug. 11, in the west end steel rod mill of the Steel Co. of Canada, destroyed about half the building, entailing a loss estimated at between \$30,000 and \$40,000, covered by insurance.

LEASIDE.—At a meeting of the council last week, it was decided to raise \$60,000 for a water-works system, and \$60,000 for sewers. Mayor McCrea should be applied to.

OTTAWA.—J. D. McArthur, contractor for the Hudson Bay railway, states that 200 miles of the line has been graded, but that the whole line will not be completed before 1915.

SHERBROOKE.—The city is contemplating the development of power on the Magog river by raising the dam at the electric light station so as to develop 500 additional horsepower.

TORONTO.—Twenty-five thousand men are working on the railway lines that will link the Canadian Pacific coast cities with the Canadian cities on the Atlantic coast. The

Notice of Sale!

IN RE

Dissolution Hecla Iron & Mining Co.

IN pursuance to an order of court, the undersigned Receivers on September 22nd, 1913, will offer for sale at public auction, at the front door of the Court House in Ironton, Ohio, 6177.53 acres more or less of land in fee simple, on which are blast furnace, several barns and about eighty dwelling houses, and also 7113.36 acres of minerals, mining rights, rights of way and interests in land in all 13290.89 acres, situate in Lawrence County, Ohio. Appraised price fixed by the court at \$85,000.

Said land is extensively underlaid with coal, iron ore, limestone, clays, ganister rock and other minerals.

For further information call upon or address

**A. C. ROBISON,
THOS. D. SHIRKEY,
Receivers**

Ironton, Ohio

Canadian Northern railway is building the transcontinental line and the National Transcontinental or Grand Trunk Pacific the other. Several large steel bridges are yet to be built on both lines.

TORONTO.—A charter of incorporation has been issued to the Turbine Equipment Co., Ltd., with \$40,000 capital, to manufacture engines and machinery, with James L. Ross, Charles J. F. Collier and Edith M. Carruthers as provincial directors.

TORONTO.—The Standard Wrapping Machines, Ltd., has been incorporated, capitalized at \$220,000, to manufacture wrapping machinery; John P. Northey, Thomas H. Plummer, George Broughall and others are provincial directors.

QUEBEC

MONTREAL.—A charter has been granted to the Canadian Gurney Elevator Co. with a capital of \$50,000.

MONTREAL.—The Montreal Locomotive Works, Ltd., is making extensions to its shops at Longue Pointe, and adding new equipment. The machine shop is being extended 132 x 220 feet, and an iron foundry measuring 220 x 330 feet, consisting of three bays, is being built. There will also be a running shed measuring 75 x 120 feet, and several traveling cranes will be purchased. The improvements will cost about \$600,000.

SASKATCHEWAN

PRINCE ALBERT.—The city council has decided to suspend operations to some extent on the La Colle Falls dam, owing to lack of funds. Excavations for the tail race and spillway will be continued.

SASKATOON.—Work will start this week on the new traffic bridge across the South Saskatchewan river, which is being erected by the Provincial government and the city at a cost of \$400,000.

SASKATOON.—R. J. Lecky & Co., of Regina, have been awarded the contract for the erection of a new traffic bridge across the river at a cost of \$398,000, which is \$98,000 above the amount the city estimated to spend for the work. The ratepayers will be asked to vote the additional money.

Penton's Book News

Publishers and Book Handlers

CLEVELAND

A Few of our Standard Publications.

PRACTICAL ALLOYING. By John F. Buchanan	\$2.50
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ALLOYS AND THEIR INDUSTRIAL APPLICATION. By E. F. Law	4.50
ALUMINUM PRODUCTION AND ITS INDUSTRIAL USE. By Adolphe Minet	2.50
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HOW TO MAKE CONVERTER STEEL CASTINGS. By Arthur Simonson75
THE CUPOLA FURNACE. By Edward Kirk	3.50
FOUNDRY PRACTICE. By R. H. Palmer	2.00
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PENTON'S FOUNDRY LIST. (A U. S. and Canadian Foundry Directory)	10.00
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NAVIGATOR'S CHARTS. (Charts for the great lakes, rivers and coasts)50

We have other books on Electricity, Engineering, Fuels, etc., about which we would be pleased to furnish information upon request.

REMEMBER

"Any Book on Any Subject" is our Serving Capacity.

PENTON'S BOOK NEWS
CLEVELAND

TRADE NOTES

BILLERICA, MASS.—The new locomotive and car repair shops of the Boston & Maine railroad at this place are nearing completion, and will probably be placed in operation some time in October.

BRIDGETON, N. J.—The Ferracuta Machine Co., manufacturer of presses, dies and sheet metal tools, has just celebrated the fiftieth anniversary of its organization, by a gathering at the home of the president, Oberlin Smith, whose work as an engineer, as well as executive, is well known throughout the country.

CANAL FULTON, O.—William S. Kinney, trustee in bankruptcy of the Fulton Machine & Forging Co., advises that the drop forge plant of the concern will be sold at private sale by authority of the referee. The plant has been operated by the trustee for the past month, and will be sold as a going concern.

CANTON, O.—The Berger Co. is building a water pumping plant. It has used city water. The United Steel Co. and Carnahan Tin Plate & Sheet Co., Canton, have changed from city water to supplies of their own.

CANTON, MD.—The Canton Iron & Steel Works advises the mills, engines and shears have not been sold by the company, but that H. H. Light, Lebanon, Pa., has bought some of the boilers, floor plates, etc., in the damaged portion of the works.

CINCINNATI.—John Hy. Andrew & Co., Ltd., 107 West street, New York City, advises that the Union Iron & Steel Co., Cincinnati, has been appointed exclusive agent in its territory for Toledo (Sheffield) tool steels. C. F. McKinnon, formerly with the Sheffield Tool Steel Co., Cincinnati, is connected with the Union Iron & Steel Co. The Sheffield Tool Steel Co. is retiring from business.

GARY, IND.—The United States Steel Corporation has started to add to its \$65,000 baseball park. These improvements will include a 400-yard running track and a 100-yard straight-away.

GRAND RAPIDS, MICH.—The Rodgers Iron Mfg. Co. has been adjudicated bankrupt. It is stated liabilities amount to \$16,657.85, while the assets are given at about \$9,825.09. The case has been referred to Referee in Bankruptcy Kirk E. Wicks.

MILWAUKEE.—The American Safety Appliance Co., Manufacturers Home building, has changed its corporate style to Milwaukee Die Casting Co. The concern operates a large aluminum and alloy casting shop, specializing in die castings for electric lamps for automobiles.

MILWAUKEE.—The Allis-Chalmers Mfg. Co., Milwaukee, has elected to come under the provisions of the Wisconsin workmen's compensation or industrial insurance act. This action brings 4,888 employes under the act. This is the largest number of employes to receive the benefit of the provisions of the law by election of a single employer.

MONTREAL.—President Nathaniel Curry, of the Canadian Car & Foundry Co., says that Canadian car companies are so busy this year that they have had to sub-let orders for 1,000 cars to American firms.

MUNCIE, IND.—J. D. Miltenburger, receiver, has sold the Muncie Iron & Metal Co.'s plant to Max Zeigler, one of the partners in the original firm.

NEWARK, N. J.—L. C. Dilks, contracting manager of the Eastern Steel Co., at New York City, has been appointed receiver of the Goeller Iron Works, steel fabricators, upon the application of several creditors. The assets and liabilities have not been disclosed, but Charles Goeller, president of the company, states he is confident that the company will pay in full. The plants are to be continued in operation.

NEW HAVEN, CONN.—The New Haven Iron & Steel Co. has closed its plant for the month of August, the excessive heat being too much for the workers.

NEW ORLEANS.—Frederick J. Joubert, vice president and treasurer of the Payne & Joubert Machine & Foundry Co., recently filed a petition in bankruptcy, declaring his liabilities to be \$211,111, against assets amounting to \$94,945.68.

NEW YORK CITY.—A petition in bankruptcy has been filed against the Finrock Iron Works, 405 East Ninety-ninth street. The business was started as a firm in 1903 and incorporated in March, 1909.

NEW YORK CITY.—A petition in bankruptcy has been filed against the United Metal Mfg. Co., 525 West Twenty-sixth street,

manufacturer of brass parts and fittings for gas and electric light fixtures. Charles F. Wells, an employe of the company, has been made receiver with authority to continue the business. The liabilities are placed at \$90,000 and the assets at about \$75,000.

NEW YORK CITY.—Arthur F. Gotthold has been appointed receiver upon application of creditors of the Ernst Wiener Co. with general offices at 50 Church street. The Ernst Wiener Co. is engaged in the manufacture of industrial railroads and cars for all classes of manufacturing plants.

PITTSBURGH.—The Westinghouse Electric & Mfg. Co.'s old factory building, where George Westinghouse's inventions first were executed on a substantial scale, was burned to the ground recently.

PITTSBURGH.—Moving pictures, which were a part of the H. C. Frick Coke Co.'s "Safety First" campaign, including many views in the Connellsville coke regions, are now being exhibited in West Virginia.

PITTSBURGH.—The Industrial Development Commission has opened negotiations with the government in an attempt to have the proposed government plant for the manufacture of armor plate erected in the Pittsburgh district.

PITTSBURGH.—The Blaw Steel Construction Co. announces the removal of its general offices in the Westinghouse building, Pittsburgh, to its new building located at the works at Hoboken, Pa. It also announces the establishment of a Pittsburgh city sales office in the Farmers Bank building, room 621.

PITTSBURGH.—Julian Kennedy, engineer, is making rapid progress in appraising properties of the Wheeling Steel & Iron Co., La Belle Iron Works, the Whitaker-Glessner Co. and the Portsmouth Steel Co., which are named as parties to a proposed consolidation. Unofficial reports from Wheeling say that it is proposed to merge the companies in a \$32,000,000 concern.

PORTLAND, ORE.—The Willamette Iron & Steel Works, B. C. Ball general manager, has put out a great many logging engines during the past year.

PROVIDENCE, R. I.—Creditors have petitioned that the Standard Wrench & Tool Co. of East Providence be adjudged a bankrupt.

PROVIDENCE, R. I.—The Richardson & Boynton Co., manufacturer of steam and hot water boilers, furnaces, etc., New York City, is planning to open a branch office here.

RACINE, WIS.—The J. I. Case T. M. Co., Racine, won nine out of a possible ten gold medals in the recent international tractor competition held at Winnipeg by direction of the Canadian government. The 110-horsepower Case steam tractor established a new fuel economy record, using but 2.65 pounds of coal per horsepower.

RACINE, WIS.—The administrative and executive departments of the Racine Mfg. Co., manufacturing metal and wood automobile bodies and trimmings, have been reorganized. Frank K. Bull, president, has retired and is succeeded by C. A. Hamilton, formerly with the Wisconsin Engine Co., at Corliss, and until recently vice president of the Lavigne Gear Co., Racine. Mr. Bull is well known as president of the J. I. Case Threshing Machine Co., Racine, and was unable to give the Racine Mfg. Co. the attention it deserved. He retains his heavy financial interest, however. W. F. McCaughey has been elected vice president, while Harold Smith and George Jaegers continue as secretary and treasurer, respectively. The company has contracts which insure a full-time run from now until Aug. 1, 1914.

SAN FRANCISCO.—Goldschmidt Thernit Co., 90 West street, New York City, has moved its local office from 432-436 Folsom street to 329-333 Folsom street.

SOUTH CONNELLSVILLE, PA.—Striking puddlers at the plant of the Sligo Iron & Steel Co. have returned to work, having accepted terms offered by the company.

YOUNGSTOWN, O.—The Republic Iron & Steel Co. may start its 20-inch mill at the Brown-Bonnell plant within a few days.

YOUNGSTOWN, O.—The Youngstown Sheet & Tube Co. has retained D. H. Burnham & Co., Chicago, well known architects, to draw plans for its proposed office building.

YOUNGSTOWN, O.—Moving pictures showing the various processes of manufacturing iron and steel products in this city will be displayed here if plans of promoters are carried out.